

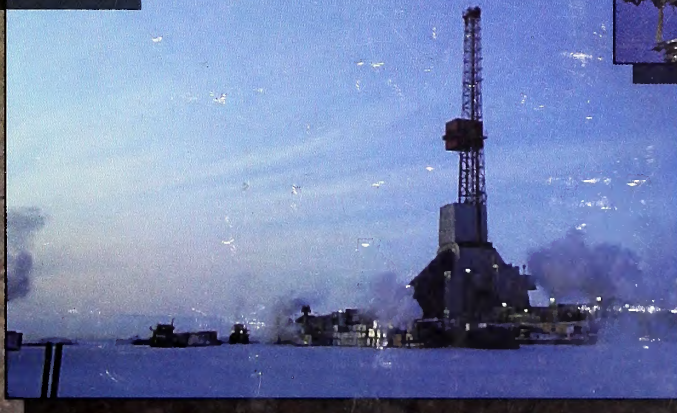


May 2008

# Northeast National Petroleum Reserve-Alaska

**FINAL Supplemental**  
Integrated Activity Plan/Environmental Impact Statement

**Volume 5: Appendices, Bibliography, Glossary,  
Acronyms**



Alaska



FES 08-17



# The Bureau of Land Management Today

## *Our Vision*

To enhance the quality of life for all citizens through the balanced stewardship of America's public lands and resources.

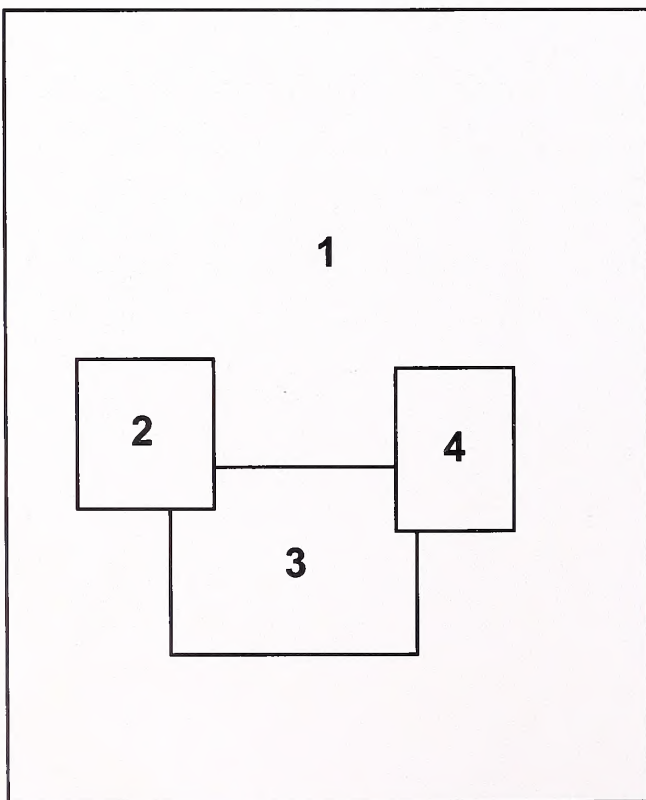
## *Our Mission*

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

**BLM/AK/PL-08/016+1610+930**

## **BLM Cover Photos:**

1. Teshekpuk Lake, Alaska. Photo by Richard Kemnitz.
2. Caribou, northern Alaska.
3. Drilling Rig at Hunter A well in the Northeast National Petroleum Reserve-Alaska.  
Photo by BLM Branch of Energy
4. Canada Goose, northern Alaska.





Northeast National Petroleum  
Reserve-Alaska

FINAL

Supplemental Integrated Activity Plan/  
Environmental Impact Statement

VOLUME 5:  
Appendices, Bibliography, Glossary, List of  
Acronyms

Prepared by

U.S. Department of Interior  
Bureau of Land Management  
Anchorage, Alaska

In Cooperation with the North Slope Borough

May 2008







## TABLE OF CONTENTS, VOLUME 5

### APPENDICES

Appendix A: ANILCA Section 810 Analysis of Subsistence Impacts.....	A-1
Appendix B: Federal, State, and Local Permits and/or Approvals for Oil and Gas Exploration, Development, and Production Activities .....	B-1
Appendix C: Essential Fish Habitat.....	C-1
Appendix D: Alternative A Stipulations.....	D-1
Appendix E: Alternatives B and C Stipulations and Required Operating Procedures .....	E-1
Appendix F: Alternative D Stipulations and Required Operating Procedures .....	F-1
Appendix G: Examples of Public Health Mitigation Strategies .....	G-1
Appendix H: Common, Scientific and Inupiaq Names of Species Listed in Supplemental IAP/EIS .....	H-1
Appendix I: Historic Sites.....	I-1
Appendix J: BLM Sensitive Species List for Alaska.....	J-1
Appendix K: Information, Models, and the Assumptions Used to Analyze the Effects of Oil Spills .....	K-1
Appendix L: Northeast National Petroleum Reserve-Alaska Integrated Activity Plan/ Environmental Impact Statement, 1998 Record of Decision.....	L-1

### BIBLIOGRAPHY

### GLOSSARY

### LIST OF ACRONYMS

### LIST OF TABLES

Table I-1. Documented Alaska Heritage Resource Services Sites.....	I-1
Table I-2. Documented Traditional Land Use Inventory Sites .....	I-6
Table K-1. Oil Spill Scenario Assumptions for the Alternatives.....	K-4
Table K-2. Large Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska .....	K-8
Table K-3. Small Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska .....	K-10
Table K-4. Small Refined Oil Spills <500 bbl Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska .....	K-11
Table K-5. Fate and Behavior of a Hypothetical 500 bbl Oil Spill From Lagoon Pipelines ....	K-12
Table K-6. Fate and Behavior of a Hypothetical 900 bbl Oil Spill From a Lagoon Facility ....	K-13
Table K-7. Oil Spill Rates and Spill-size Categories Used to Estimate Large Crude Oil Spills for the Cumulative Analysis .....	K-14
Table K-8. Cumulative Oil-Spill-Occurrence Estimates $\geq 500$ bbl and $\geq 1,000$ bbl over Assumed 15-20 Year Production Life of the Northeast National Petroleum Reserve – Alaska.....	K-16



## **Other Volumes of the Northeast National Petroleum Reserve-Alaska Final Supplemental IAP/EIS Include:**

### **VOLUME 1**

**Chapter 1 – Introduction**

**Chapter 2 – Alternatives**

**Chapter 3 – Affected Environment**

### **VOLUME 2**

**Chapter 4 – Environmental Consequences (sections 4.1 – 4.6)**

### **VOLUME 3**

**Chapter 4 – Environmental Consequences (continued: sections 4.7 – 4.12)**

### **VOLUME 4**

**Chapter 5 – Consultation and Coordination**

**Chapter 6 – Comments and Responses**

### **VOLUME 6: Maps**



# **Appendix A: ANILCA SECTION 810 ANALYSIS OF SUBSISTENCE IMPACTS**







## APPENDIX A

# ANILCA SECTION 810 ANALYSIS OF SUBSISTENCE IMPACTS

A.1	SUBSISTENCE EVALUATION FACTORS .....	A-3
A.2	ANILCA § 810(a) Evaluations and Findings for All Alternatives and the Cumulative Case.....	A-5
A.2.1	Evaluation and Findings for Alternative A (No Action Alternative) .....	A-5
A.2.2	Evaluation and Findings for Alternative B.....	A-8
A.2.3	Evaluation and Findings for Alternative C.....	A-12
A.2.4	Evaluation and Findings for Alternative D—Preferred Alternative.....	A-14
A.2.5	Evaluation and Findings for the Cumulative Case.....	A-16
A.3	Notice and Hearings.....	A-20
A.4	Subsistence Determinations Under ANILCA § 810(a)(3)(A), (B), and (C) .....	A-20
A.4.1	Significant Restriction of Subsistence Use is Necessary, Consistent with Sound Management Principles for the Utilization of Public Lands .....	A-21
A.4.2	The Proposed Activity will Involve the Minimal Amount of Public Lands Necessary to Accomplish the Purposes of such Use, Occupancy or Other Disposition.....	A-21
A.4.3	Reasonable Steps will be Taken to Minimize Adverse Impacts upon Subsistence Uses and Resources Resulting from such Actions .....	A-22







## APPENDIX A

### ANILCA § 810 ANALYSIS OF SUBSISTENCE IMPACTS

In 2001, the President created the National Energy Policy Development Group (NEPDG), consisting of the Vice-President and other key cabinet members. The primary task of the group was to “develop a national energy policy designed to help the private sector, and, as necessary and appropriate, state and local governments, and promote dependable, affordable, and environmentally sound production and distribution of energy for the future” (NEPDG 2001). In May 2001, the NEPDG released the National Energy Policy report, a comprehensive list of findings and key recommendations that were adopted by the President, and that form the basis of the President’s National Energy Policy. Specifically, the policy directs the Secretary of the Interior to “consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska,” and that “such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve – Alaska.” To that end, the Bureau of Land Management (BLM) initiated a process to amend the 1998 Integrated Activity Plan for the Northeast Planning Area of the National Petroleum Reserve – Alaska (NPR-A). The Amended IAP/EIS was issued in January 2005, and was followed by a record of decision (ROD) in January 2006. On September 25, 2006, the U.S. District Court for the District of Alaska found that the Amended IAP/EIS failed to adequately address the cumulative impacts increased activities in the Northeast NPR-A planning area will have when combined with increased activity in the Northwest NPR-A planning area. The court vacated that ROD and enjoined the Secretary of the Interior from further action in the Northeast planning area under that ROD. This Supplemental IAP/EIS provides additional analysis necessary to fully address the deficiencies noted by the court and updates relevant sections of the document with new information.

Chapters 3 (Affected Environment) and 4 (Environmental Consequences) of the Supplemental Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement (Supplemental IAP/EIS) provide a detailed description of both the affected environment of the planning area and the potential adverse effects of the various alternatives to subsistence and to subsistence resources. This appendix uses the detailed information presented in the Supplemental IAP/EIS to evaluate the potential impacts to subsistence pursuant to Section 810(a) of the Alaska National Interest Land Conservation Act (ANILCA).

#### A.1 SUBSISTENCE EVALUATION FACTORS

Section 810(a) of ANILCA, 16 USC § 3120, requires that an evaluation of subsistence uses and needs be completed for any federal determination to “withdraw, reserve, lease, or otherwise permit the use, occupancy or disposition of public lands.” As such, an evaluation of potential impacts to subsistence under ANILCA § 810(a) must be completed for the Supplemental IAP/EIS. ANILCA requires that this evaluation include findings on three specific issues:

- The effect of use, occupancy, or disposition on subsistence uses and needs;
- The availability of other lands for the purpose sought to be achieved; and



- Other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (16 USC § 3120).

The evaluation and findings required by ANILCA § 810 are set out for each of the four alternatives considered in the Supplemental IAP/EIS.

A finding that the proposed action may significantly restrict subsistence uses imposes additional requirements, including provisions for notices to the State of Alaska and appropriate regional and local subsistence committees, a hearing in the vicinity of the area involved, and the making of the following determinations, as required by Section 810(a)(3):

- Such a significant restriction of subsistence uses is necessary, and consistent with sound management principles for the utilization of the public lands;
- The proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of use, occupancy, or other disposition; and
- Reasonable steps will be taken to minimize adverse effects upon subsistence uses and resources resulting from such actions.

To determine if a significant restriction of subsistence uses and needs may result from any one of the alternatives discussed in the Supplemental IAP/EIS, including their cumulative effects, the following three factors in particular are considered:

- The reduction in the availability of subsistence resources caused by a decline in the population or amount of harvestable resources;
- Reductions in the availability of resources used for subsistence purposes caused by alteration of their normal locations and distribution patterns; and
- Limitations on access to subsistence resources, including from increased competition for the resources.

A significant restriction to subsistence may occur in at least two instances: 1) when an action substantially reduces populations or their availability to subsistence users, and 2) when an action substantially limits access by subsistence users to resources. Chapter 3 (Affected Environment) of the Supplemental IAP/EIS provides information on areas and resources important for subsistence use, and the degree of dependence of affected villages on different subsistence populations. Chapter 4 (Environmental Consequences) provides much of the data on levels of reductions and limitations under each alternative, and is used to determine whether the action would cause a significant restriction to subsistence. The information contained in the Supplemental IAP/EIS is the primary data used in this analysis.

A subsistence evaluation and findings under ANILCA § 810 must also include a Cumulative Impacts analysis. Section A.2, below, begins with evaluations and findings for each of the four alternatives discussed in the Supplemental IAP/EIS. Finally, the cumulative case, as discussed in Chapter 4 (Environmental Consequences) of the Supplemental IAP/EIS, is evaluated. This approach helps the reader to separate the subsistence restrictions that would potentially be caused by activities proposed under the four alternatives from those that would potentially be caused by past, present, and future activities that could occur, or have already occurred, in the surrounding area.

When analyzing the effects of the four alternatives, particular attention is paid to those communities who have the potential to be most directly impacted by the proposed actions—



Anaktuvuk Pass, Atkasuk, Barrow, Nuiqsut, and Wainwright. These communities are located within or adjacent to the Northeast Planning Area. The cumulative case expands the analysis to include the entire North Slope, including indirect effects to communities located in other areas of the state (i.e., the Yukon-Kuskokwim Delta), to assess any impacts to subsistence that may result because of negative effects to migratory subsistence species.

In addition to ANILCA, Environmental Justice, as defined in Executive Order 12898, also calls for an analysis of the effects of federal actions on minority populations with regard to subsistence. Specifically, Environmental Justice is:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Section 4-4 of Executive Order 12898, regarding the Subsistence Consumption of Fish and Wildlife, requires federal agencies to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence, and to communicate to the public any risks associated with the consumption patterns. To this end, the subsistence analyses of all alternatives, located in Chapter 4 (Environmental Consequences) of the Supplemental IAP/EIS, have been reviewed and found to comply with Environmental Justice.

## **A.2 ANILCA § 810(a) Evaluations and Findings for All Alternatives and the Cumulative Case**

The following evaluations are based on information relating to the environmental and subsistence consequences of alternatives A through D, and the cumulative case as presented in Chapter 4 (Environmental Consequences) of the Supplemental IAP/EIS. The stipulations discussed in Chapter 2 (Alternatives) of the Supplemental IAP/EIS are also considered for the alternatives to which they apply. The evaluations and findings focus on potential impacts to the subsistence resources themselves, as well as access to resources, and economic and cultural issues that relate to subsistence use.

### **A.2.1 Evaluation and Findings for Alternative A (No Action Alternative)**

Alternative A of the Supplemental IAP/EIS is the No Action Alternative. Selection of this alternative would result in continued management of the Northeast NPR-A as specified in the 1998 Northeast National Petroleum Reserve – Alaska IAP/EIS Record of Decision (ROD; 1998 Northeast IAP/EIS ROD). In effect, Alternative A is the preferred alternative from the previous 1998 EIS, and as such, a subsistence evaluation as required by the ANILCA § 810 has already been completed. The evaluation and findings presented here reaffirm the previous conclusion that impacts to subsistence as a result of this alternative would be minimal.



#### **A.2.1.1 Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Uses and Needs**

Under Alternative A, 13% of the planning area would remain unavailable (87% available) for oil and gas leasing, including much of the Teshekpuk Lake Special Area, and important waterfowl and caribou habitat. All of the special areas and site-specific prohibitions, as well as the 79 stipulations defined in the ROD, would remain in effect.

The analysis of Alternative A on subsistence presented in **section 4.3.12, *No Action Alternative, Subsistence***, considers the effects of non-oil and gas activities, the effects of oil and gas activities, the effects of oil spills, and the effectiveness of the stipulations required by BLM, as discussed in the 1998 Northeast IAP/EIS ROD. The analysis concludes that the No Action Alternative would have a negligible effect on subsistence species and on access to subsistence resources, and that mitigation measures developed by BLM in conjunction with local communities would serve to minimize, to the extent possible, impacts to subsistence use by the communities of Anaktuvuk Pass, Nuiqsut, Atkasuk, Wainwright or Barrow.

Effects to subsistence resources by non-oil and gas activities consist primarily of those actions associated with research. Numerous studies are conducted on a year-round basis on the North Slope, including aerial surveys by fixed-wing aircraft or helicopter, or ground surveys on foot or by off-highway vehicle (OHV), all of which have the potential to disturb animals. The most frequent complaint voiced by local subsistence users is that a large amount of aerial disturbance to animals occurs each field season in conjunction with scientific studies (Subsistence Advisory Panel [SAP] Minutes, June 6, 2002 meeting; SAP Minutes, August 22, 2002 meeting). Many of the scientific studies that currently occur are a result of stipulations imposed on oil and gas activities in the planning area; however, these same mandatory stipulations serve to minimize the potential effects of conducting research. Based on the analysis presented in Chapter 4 (Environmental Consequences), the effects of non-oil and gas activities on the species utilized by subsistence users is expected to be localized and short-term, and to have no regional population effects.

Oil and gas-related activities allowed under the No Action Alternative include seismic exploration, exploratory drilling, and development/production. Each of these activities has the potential to displace animals, with exploration potentially causing temporary displacement in the area of activity, and development/production potentially causing multi-year displacement during construction, and until the animal becomes habituated to the resultant infrastructure. Access by subsistence users could be impacted if the animals they wish to hunt have been displaced to areas much farther from their normal hunting grounds. However, many of the stipulations in the 1998 ROD would minimize the effects of oil and gas activities on animal populations, their range, and access to hunting areas by subsistence users (see **section 4.3.12.3, *Effectiveness of Stipulations***).

Oil spills have the potential to impact subsistence species as well as subsistence harvest patterns, depending on the amount and the location of the spill. Small spills are unlikely to cause great damage, especially if contained on land. Large spills are unlikely to occur during the exploration phase of oil development, but could occur once production infrastructure and facilities were in place. Several stipulations pertaining to spills and spill response are included under the No Action Alternative, which serve to reduce the potential impacts of oil spills to subsistence species and use.



As stated in **section 4.3.13.4, *Sociocultural Systems, Conclusion***, the 1998 Northeast IAP/EIS ROD was the result of several years of collaboration between the communities near the planning area, local governments and agencies, and BLM. The stipulations comprise essential protections for subsistence resources, cabins, camps, and river corridors, and also define the system of conflict negotiation to be used by permittees, leaseholders, subsistence users, and the BLM. Residents living on the North Slope, especially those in the village of Nuiqsut, view the 1998 stipulations, river setbacks, and designated special areas as a negotiated compromise between the Iñupiat people, the federal government, and the oil industry. Retention of the 1998 Northeast IAP/EIS ROD is favored by many individuals, local agencies, and local governments, as the 1998 Northeast IAP/EIS ROD is viewed as an effective plan that allows for oil and gas activity and the Iñupiat way of life to effectively coexist (ENSR 2004 Public Scoping Summary Report for the Amendment to the National Petroleum Reserve – Alaska Integrated Activity Plan/Environmental Impact Statement).

#### **A.2.1.2 Evaluation of the Availability of Other Lands for Oil and Gas Exploration and Development**

The Naval Petroleum Reserves Production Act of 1976 (NPRPA), as amended, gave the Secretary of the Interior the authority to conduct oil and gas leasing in the Northeast NPR-A. However, the law prohibited petroleum production from occurring in the NPR-A until authorized by Congress. In 1980, Congress granted that authorization and directed the Secretary of the Interior to undertake a program of competitive leasing of potential oil and gas tracts in the Reserve. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska." BLM is undertaking this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy, as well as BLM's responsibilities to manage these lands under authority of the NPRPA and Federal Land Policy and Management Act (FLPMA), and other authorities cited elsewhere in this EIS. Alternative A would continue the authorization of oil and gas exploration or development activities in the Northeast NPR-A under the 1998 Northeast IAP/EIS ROD. Other lands managed by BLM are either too remote for economically viable oil and gas production, or have a low probability of containing sufficient quantities of oil or gas. State and Native Corporation Lands cannot be considered in a BLM plan, and under BLM policy other BLM lands outside of Alaska are not considered under ANILCA.

#### **A.2.1.3 Evaluation of Other Alternatives that Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes**

Alternatives that would reduce or eliminate the use of public lands needed for subsistence include: 1) making more land in the Northeast NPR-A unavailable for oil and gas leasing, or 2) not allowing oil and gas activity to occur. However, neither of these alternatives would satisfy the underlying purpose of the IAP/EIS to make more lands available for leasing. The Secretary of the Interior has directed BLM to consider additional lands in the Northeast NPR-A to the extent it can be done in an environmentally sound manner. Reducing the number of acres available for energy development would contradict this direction, and would go against the President's stated National Energy Policy. Additionally, the 1998 Northeast IAP/EIS ROD allowed the BLM to enter into contracts with several oil companies, by leasing land for oil and gas exploration. All of these leases are still in effect. **Section 2.5, *Alternatives Considered but Eliminated from Detailed Analysis*** of the Supplemental IAP/EIS discusses other alternatives that were considered, but eliminated from detailed analysis.



#### A.2.1.4 Findings

Alternative A would not significantly restrict subsistence uses and needs. The impacts to subsistence resources and access discussed above would be minimal, or would be adequately mitigated by special area designation and stipulations under which the lessee/permittee must operate. This finding applies to Anaktuvuk Pass, Atqasuk, Barrow, Wainwright, and Nuiqsut.

### A.2.2 Evaluation and Findings for Alternative B

Alternative B, as well as the stipulations and required operating procedures (ROPs) accompanying it, takes into consideration all comments and concerns generated during the scoping process, as well as the stated direction from the Secretary of the Interior to look at lands previously unavailable for leasing in the planning area. Alternative B of the Supplemental IAP/EIS makes approximately 95% of all lands within the planning area available for oil and gas leasing, which includes approximately 387,000 acres that were formerly off-limits to leasing. Management practices would emphasize performance-based stipulations and ROPs on surface activities, consultation with local residents, and coordinated scientific studies to protect wildlife habitat, subsistence use areas, and other resources. In addition, approximately 213,000 acres northeast of Teshekpuk Lake that are currently unavailable for oil and gas leasing would remain unavailable for leasing, to provide for protection of wildlife and subsistence resources.

#### A.2.2.1 Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Uses and Needs

The analysis of Alternative B on subsistence is presented in **section 4.4.12, *Alternative B, Subsistence***. This analysis considers the effects of non-oil and gas activities, the effects of oil and gas activities, the effects of oil spills, and the effectiveness of the associated stipulations and ROPs as presented by BLM. The analysis concludes that the effect of Alternative B on subsistence would be greater than that of Alternative A, but would remain localized and would not significantly affect subsistence species, access to subsistence resources, or subsistence use by the communities of Anaktuvuk Pass, Nuiqsut, Atqasuk, Wainwright or Barrow.

At issue in this evaluation are the differences between Alternative A and Alternative B, and whether these differences would be significant enough to cause a substantial impact to the populations of subsistence species, to displace these species from their current habitat, or to limit access to current, traditional hunting areas by subsistence users under Alternative B. Alternative B primarily differs from the No Action Alternative in the following regards:

- Performance-based stipulations and ROPs would replace the 79 prescriptive stipulations in the 1998 Northeast IAP/EIS ROD. Stipulations refer to requirements that the leaseholder must comply with and are attached to the lease document, whereas ROPs are requirements that any operator working in the Northeast NPR-A would be required to follow, and would be attached to permits for activity.
- Some of the 79 stipulations from the 1998 Northeast IAP/EIS ROD that are already required by existing regulation or law would not have a corresponding stipulation or ROP under Alternative B. This does not mean that the lessee or permittee would be able to ignore the actions/activities covered by the original stipulations, only that these actions/activities would be covered by law or regulation, and, therefore, must be followed in order to comply with the law. This approach would actually serve to strengthen the intent, in that lessees/permittees would not mistakenly believe that they could be granted an exception to the stipulation using the BLM exception process.



- An additional 387,000 acres would be available for oil and gas leasing. However, within these additional acres, no permanent oil and gas facilities would be allowed within ¼ mile of the shore of identified goose-molting lakes, or within ¾ mile of the coast. Approximately 213,000 acres located in the goose molting/caribou habitat use area northeast of Teshekpuk Lake would remain unavailable for oil and gas leasing.
- Surface activity, including exploratory and delineation wells, would be allowed within the former “No Surface Activity” zone south of Teshekpuk Lake. However, the construction of permanent facilities would not be allowed until the lessee has conducted a study that includes a minimum of 3 years' worth of data on caribou movements.
- “Sensitive Area Consultation” zones from the 1998 Northeast IAP/EIS ROD would be replaced by ROP H-1, which requires consultation with the North Slope Borough (NSB), the Subsistence Advisory Panel, and affected communities, regardless of where the activity would take place.
- Permanent oil and gas facilities would not be allowed within ¼ mile of lakes identified as “Deep Water Lakes.” The 1998 Northeast IAP/EIS ROD did not allow permanent facilities within ¼ mile of fish-bearing lakes in a large area south of Teshekpuk Lake, but each individual lake was not specifically identified.

Of the differences between alternatives A and B, only two would potentially cause Alternative B to substantially affect subsistence resources or their use: the availability of additional land for oil and gas leasing from within the area north and west of Teshekpuk Lake, and the removal of the “No Surface Occupancy” zone south of Teshekpuk Lake. Other changes, such as updating the stipulations and adopting ROPs to conform to an adaptive management approach, would not reduce the level of protection afforded.

It is expected that impacts to terrestrial mammals and subsistence use in the vicinity of Teshekpuk Lake would be greater under Alternative B than under the No Action Alternative, particularly with respect to caribou calving and insect-relief habitat, given the additional 387,000 acres that would be available for oil and gas leasing. However, the 213,000 acres that would be unavailable to leasing are important to caribou migrating between calving and insect-relief areas and the wintering grounds. This area, as well as the stipulations that have been developed to further protect caribou found near Teshekpuk Lake, would serve to protect the resource from substantial decline at the population level (see **sections 4.4.9.1, *Terrestrial Mammals*, and 4.4.12.2, *Subsistence, Oil and Gas Exploration and Development Activities***).

Impacts are also expected to be greater for birds, especially brant, under Alternative B when compared to Alternative A (see **section 4.4.8, *Birds***). The communities of Barrow and Nuiqsut utilize the planning area for harvesting birds, with birds comprising between 1.8–2.6% of each community's annual harvest (Fuller and George 1997). The species most heavily harvested by residents include white-fronted geese, black brant, and king and common eiders. As many as 30% of the Pacific flyway population of brant may be present in the Teshekpuk Lake goose molting area during the molting period, making it one of the single most important areas for molting brant overall. As a result, impacts to brant in the planning area that would result in population level declines have the potential to affect harvesters across the North Slope, in Northwest Alaska, and in the Yukon-Kuskokwim Delta. However, the primary reason for making 213,000 acres unavailable to leasing under Alternative B is to protect important habitat for caribou and molting geese. In addition, numerous lease stipulations and ROPs were developed to protect birds and their habitat within the planning area, including the K-stipulations, which provide for a number of measures designed to reduce the effects of development on molting geese by establishing setbacks from lake shorelines within which



construction of permanent oil and gas facilities would not be permitted, regulating water extraction from lakes, and minimizing or eliminating disturbance from aircraft during critical periods.

Impacts to vegetation, fish, and other resources used for subsistence purposes are expected to be minor (see **sections 4.4.5, *Vegetation*; 4.4.7, *Fish*; and 4.4.9, *Mammals***).

Under Alternative B, the greatest potential impact to subsistence use would be the removal of the “No Surface Activity” zone, which extends from the west side to the east side of the planning area in a band south of Teshekpuk Lake. Comments received during the scoping process stressed the importance of protecting essential caribou movement/migration corridors, located both to the east and the west of Teshekpuk Lake. The construction of permanent facilities, such as pipelines, roads, and production pads, within these narrow corridors could result in displacement of the Teshekpuk Lake Caribou herd, if the caribou were unable to get to their known insect-relief habitat during periods of intense insect harassment. Furthermore, removal of the “No Surface Activity” zone, in addition to opening more lands for leasing, would allow permanent facilities to be constructed within much of the Teshekpuk Lake Herd calving area. While such construction might not affect the population of the herd, it could result in a dramatic shift in the current use-area of the caribou, resulting in displacement of the herd. Stipulation K-5 would serve to minimize the potential disturbance to caribou by requiring a 3-year study of caribou movements in the vicinity of the facility, before BLM would authorize construction.

In addition to the potential displacement of subsistence resources under Alternative B, the elimination of the “No Surface Activity” zone, as well as the additional acres available for leasing, could result in future infrastructure such as pipelines, roads, production pads, and wells. Oil industry infrastructure on the east side of the Colville River has resulted in the nonuse of this area by the residents of Nuiqsut, who do not feel comfortable hunting near or around oil developments. If enough economically recoverable oil was discovered to warrant additional development in the Nuiqsut, Atqasuk, or Barrow traditional subsistence use areas, hunters could avoid the development. The result would be an overall reduction in lands used for subsistence purposes. Effective communication and consultation by the oil industry, local communities, and the BLM would be essential when, and if, development were to occur in the NPR-A. Required Operating Procedures H-1 and H-2 would be the primary mitigation measures in place to ensure adequate access to traditional hunting areas by the residents of Nuiqsut, Barrow, and Atqasuk in the Teshekpuk Lake area.

As stated in the evaluation for the Alternative A, residents living on the North Slope, especially those in the village of Nuiqsut, view the 1998 Northeast IAP/EIS ROD as a negotiated compromise between the Iñupiat people, the federal government, and the oil industry. Considerable changes to the decisions in the 1998 Northeast IAP/EIS ROD, without the consensus of local communities, governments, and agencies, could create an insurmountable rift between the people of the North Slope and the Federal government, especially if their Iñupiat way of life was threatened.



### **A.2.2.2 Evaluation of the Availability of Other Lands for Oil and Gas Exploration and Development**

The NPRPA, as amended, gives the Secretary of the Interior the authority to conduct oil and gas leasing in the NPR-A. However, the law prohibited petroleum production from occurring in the NPR-A until authorized by Congress. In 1980, Congress granted that authorization and directed the Secretary of the Interior to undertake a program of competitive leasing of potential oil and gas tracts in the Reserve. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska." BLM is undertaking this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy, as well as BLM's responsibilities to manage these lands under authority of the NPRPA and FLPMA and other authorities cited elsewhere in this Supplemental IAP/EIS. Alternative B would continue the authorization of oil and gas exploration or development activities in the NPR-A under performance-based stipulations and ROPs identified in **section 2.7, *Stipulations and Required Operating Procedures*** of the Supplemental IAP/EIS. Other lands managed by BLM are either too remote for economically viable oil and gas production, or have a low probability of containing sufficient quantities of oil or gas. State and Native Corporation Lands cannot be considered in a BLM plan, and under BLM policy other BLM lands outside of Alaska are not considered under the ANILCA.

### **A.2.2.3 Evaluation of Other Alternatives that would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes**

Alternatives that would reduce or eliminate the use of public lands needed for subsistence include: 1) making more land in the Northeast NPR-A unavailable for oil and gas leasing, or 2) not allowing oil and gas activity to occur. However, neither of these alternatives would satisfy the underlying purpose of the IAP/EIS to make more lands available for leasing. The Secretary of the Interior has directed BLM to consider additional lands in the Northeast NPR-A to the extent it can be done in an environmentally sound manner. Reducing the number of acres available for energy development would contradict this direction, and would go against the President's stated National Energy Policy. Additionally, the 1998 Northeast IAP/EIS ROD allowed BLM to enter into contracts with several oil companies, by leasing land for oil and gas exploration. All of these leases are still in effect. **Section 2.5, *Alternatives Considered but Eliminated from Detailed Analysis*** of the Supplemental IAP/EIS discusses other alternatives that were considered, but eliminated from detailed analysis.

### **A.2.2.4 Findings**

Alternative B would not significantly restrict subsistence use by communities in or near the planning area (Anaktuvuk Pass, Atkasuk, Barrow, Wainwright and Nuiqsut). The impacts to most subsistence resources and access to resources would be minimal, yet displacement of the Teshekpuk Lake Herd caribou could occur, and black brant populations have shown a declining trend in recent years. However, adequate stipulations and ROPs have been incorporated in Alternative B—including specific procedures for subsistence consultation with directly affected subsistence communities, requirements for extensive studies of caribou movement, and setbacks or other protective measures specific to birds—to ensure that significant restrictions to subsistence uses and needs would not occur.



### A.2.3 Evaluation and Findings for Alternative C

Under Alternative C of the Supplemental IAP/EIS, all land under the stewardship of BLM within the planning area would be available for oil and gas leasing. All of the stipulations and ROPs included in Alternative B would also apply to Alternative C.

#### A.2.3.1 Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Uses and Needs

The analysis of the effects of Alternative C on subsistence, presented in **section 4.5.12, *Alternative C, Subsistence***, considers the effects of non-oil and gas activities, oil and gas activities, and oil spills, and the effectiveness of the stipulations and ROPs required by BLM. The analysis concludes that Alternative C would not significantly affect primary subsistence species, access to subsistence resources, or subsistence use by the communities of Anaktuvuk Pass, Atkasuk, Barrow, Wainwright or Nuiqsut. Similarly, while all analysts feel that the impact of Alternative C would be greater than that of alternatives A or B, these impacts are still viewed as being localized, of short duration, and not significant at the population level for most species.

Analyses presented for individual subsistence species (e.g., marine mammals, land mammals, and fish) also indicate that there would not be significant impacts to these species under Alternative C. However, it is expected that impacts to birds in the vicinity of Teshekpuk Lake and throughout the northern portion of the planning area would be greater under Alternative C, particularly with respect to molting waterfowl, given the greater overall scale of the assumed development activities. Impacts to birds from disturbances could be even greater if oil and gas activities occurred in areas with high bird concentrations, with high quality habitat, or that are used by species of concern.

For caribou, it is estimated that there would be an increase in the likelihood of impacts to calving areas and migration routes leading to insect-relief habitat, as well as an increased likelihood of development occurring within insect-relief habitat. If the TLH is partially displaced from its calving area, or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success would most likely be reduced. While there have been no experiments conducted with the TLH to determine whether oil development in the calving area would displace caribou or affect the productivity of the herd, caribou behavior during 1997 and 2001 suggest oil development in the TCH calving area could impact caribou.

Despite the increase in potential impacts to birds or caribou under Alternative C, most analysts indicate that the proposed stipulations and ROPs effectively mitigate any potential impacts resulting from oil and gas activity. Therefore, the potential impacts are lessened, and would not result in population level declines.

As discussed for Alternative B, eliminating the “No Surface Activity” zone, as well as making all lands available for leasing, could result in future infrastructure such as pipelines, roads, production pads, and wells. Oil industry infrastructure on the east side of the Colville River has resulted in the nonuse of this area by the residents of Nuiqsut, who do not feel comfortable hunting near or around oil developments. If enough economically recoverable oil was discovered to warrant additional development in the Nuiqsut, Atkasuk, or Barrow traditional subsistence use area, hunters could avoid the development. The result would be an overall reduction in lands used for subsistence purposes. Effective communication and consultation by the oil industry, local communities, and BLM would be essential when and if development were to



occur in the Northeast NPR-A. Required Operating Procedures H-1 and H-2 would be the primary mitigation measures in place to ensure adequate access to traditional hunting areas by the residents of Nuiqsut, Barrow, and Atqasuk in the Teshekpuk Lake Special Area.

As stated in the evaluations for alternatives A and B, residents living on the North Slope, especially those in the village of Nuiqsut, view the 1998 Northeast IAP/EIS ROD as a negotiated compromise between the Iñupiat people, the federal government, and the oil industry. Considerable changes to the decisions in the 1998 Northeast IAP/EIS ROD without the consensus of local communities, governments, and agencies to create an insurmountable rift between the people of the North Slope and the federal government, especially if their Iñupiat way of life was threatened.

#### **A.2.3.2 Evaluation of the Availability of Other Lands for Oil and Gas Exploration and Development**

The NPRPA, as amended, gave the Secretary of the Interior the authority to conduct oil and gas leasing in the Northeast NPR-A. However, the law prohibited petroleum production from occurring in NPR-A until authorized by Congress. In 1980, Congress granted that authorization and directed the Secretary of the Interior to undertake a program of competitive leasing of potential oil and gas tracts in the Reserve. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska." BLM is undertaking this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy as well as BLM's responsibilities to manage these lands under authority of the NPRPA and FLPMA and other authorities cited elsewhere in this EIS. Alternative C would continue the authorization of oil and gas exploration or development activities in the Northeast NPR-A under performance-based stipulations identified in **section 2.7, *Stipulations and Required Operating Procedures*** of the Supplemental IAP/EIS. Other lands managed by BLM are either too remote for economically viable oil and gas production, or have a low probability of containing sufficient quantities of oil or gas. State and Native Corporation Lands cannot be considered in a BLM plan, and other BLM lands outside of Alaska are not considered under the ANILCA as per BLM Policy.

#### **A.2.3.3 Evaluation of Other Alternatives that would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes**

Alternatives that would reduce or eliminate the use of public lands needed for subsistence include: 1) making more land in the Northeast NPR-A unavailable for oil and gas leasing, or 2) not allowing oil and gas activity to occur. However, neither of these alternatives would satisfy the underlying purpose of the IAP/EIS to make more lands available for leasing. The Secretary of the Interior has directed BLM to consider additional lands in the Northeast NPR-A to the extent it can be done in an environmentally sound manner. Reducing the number of acres available for energy development would contradict this direction, and would go against the President's stated National Energy Policy. Additionally, the 1998 Northeast IAP/EIS ROD allowed the BLM to enter into contracts with several oil companies, by leasing land for oil and gas exploration. All of these leases are still in effect. **Section 2.5, *Alternatives Considered but Eliminated from Detailed Analysis of the Supplemental IAP/EIS*** discusses other alternatives that were considered, but eliminated from detailed analysis.



#### A.2.3.4 Findings

Alternative C would not significantly restrict subsistence use by the communities of Anaktuvuk Pass, Atqasuk, Barrow, Wainwright and Nuiqsut. The impacts to subsistence resources and access to resources would be minimal, yet displacement of the Teshekpuk Lake Herd could occur. However, adequate stipulations and ROPs have been incorporated, including specific procedures for subsistence consultation with directly affected subsistence communities and requirements for extensive studies of caribou movement, to ensure that significant restrictions to subsistence uses and needs would not occur.

#### A.2.4 Evaluation and Findings for Alternative D—Preferred Alternative

Alternative D, the Preferred Alternative, would make approximately 86% (approximately 3.94 million acres) of the planning area's 4.6 million acres available for oil and gas leasing immediately. An additional approximately 9% (approximately 430,000 acres) would be deferred from leasing for ten years after signing of the Record of Decision (Map 2-4). Leasing could occur after that time if the existing NEPA analysis is adequate. On approximately 1,450,000 acres, including more than half of the 430,000 acres that could be leased after ten years, the alternative would prohibit permanent oil and gas facilities, except pipelines and, in some cases, roads. Management practices would emphasize performance-based stipulations and ROPs on surface activities, consultation with local residents, and coordinated scientific studies to protect wildlife habitat, subsistence use areas, and other resources.

The lands made available for immediate leasing would include all lands made available under Alternative A, except approximately 60,000 acres within the exterior shore of Teshekpuk Lake (i.e., the exclusion from leasing includes islands within the lake). The lands that would be available for leasing ten years after the signing of the ROD would include all additional lands in the planning area not within the exterior shore of Teshekpuk Lake. Under the Alternative D, Teshekpuk Lake and its islands (approximately 219,000 acres) would be unavailable for oil and gas leasing. Exploratory drilling and pipeline construction would be precluded in the deferred area for the length of the deferral and in Teshekpuk Lake length of the deferral, except that current leases encompassing parts of Teshekpuk Lake and its islands would not be affected as long as the leases are renewed. Upon relinquishment or expiration of existing leases for lands in Teshekpuk Lake and its islands, lands would be unavailable for leasing.

Alternative D would make available after ten years approximately 430,000 acres that were unavailable in the 1998 ROD. The additional lands made available by Alternative D are within the area of highest oil and gas potential in the Northeast NPR-A Planning Area, and include a part of the Teshekpuk Lake Special Area (TLSA).

##### A.2.4.1 Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Uses and Needs

The analysis of Alternative D on subsistence is presented in **section 4.6.12, *Alternative D, Subsistence***. This analysis considers the effects of non-oil and gas activities, the effects of oil and gas activities, the effects of oil spills, and the effectiveness of the associated stipulations and ROPs as presented by BLM. The analysis concludes that the effect of the Alternative D would be greater than that of Alternative A, and would remain localized and not significantly affect subsistence species as long as activity occurred outside of key habitat areas or migratory zones when animals were present. However, access to subsistence resources and an alteration in subsistence use patterns by the communities of Nuiqsut, Barrow, and possibly Atqasuk



would likely result from future development occurring in currently used traditional harvest areas.

It is expected that impacts to terrestrial mammals and subsistence use in the vicinity of Teshekpuk Lake would be greater under Alternative D than under the No Action Alternative, particularly with respect to caribou calving and insect-relief habitat, given the additional 430,000 acres that would be available for oil and gas leasing. However, limiting the amount of acreage available to permanent oil and gas activities in the seven new lease tract areas north of Teshekpuk Lake (Lease Stipulation K-11), as well as Lease Stipulations K-5, K-9, and K-10, serve to minimize potential impacts. These stipulations have been developed to protect caribou near Teshekpuk Lake, and would serve to protect the resource from substantial decline at the population level (see **sections 4.6.9.1, *Terrestrial Mammals*, and 4.6.12.2, *Subsistence, Oil and Gas Exploration and Development Activities***). Similarly, impacts to birds, especially black brant and other primary subsistence species, would be lessened by the additional stipulations proposed under Alternative D. Impacts to vegetation, fish, and other resources used for subsistence purposes are expected to be minor (see **sections 4.6.5, *Vegetation*; 4.6.7, *Fish*; and 4.6.9, *Mammals***).

The primary impact to subsistence use as a result of Alternative D is the impact to the subsistence user, and not necessarily the resource. Oil industry infrastructure on the east side of the Colville River has resulted in the nonuse of this area by the residents of Nuiqsut, who do not feel comfortable hunting near or around oil developments. If enough economically recoverable oil was discovered to warrant additional development in the Nuiqsut, Atqasuk, or Barrow traditional subsistence use areas, history has shown that hunters would avoid the development. The result would be an overall reduction in lands used for subsistence purposes. Effective communication and consultation by the oil industry, local communities, and the BLM would be essential when, and if, development were to occur in the NPR-A. Deferring leasing for ten years on 430,000 acres within the TLSA, as well as limiting the number of acres available for permanent facilities north of Teshekpuk Lake helps to reduce this impact. Additionally, Required Operating Procedures H-1 and H-2, which call for additional consultation and notification by the oil companies to local communities, would help to alleviate access issues with regard to traditional hunting areas by the residents of Nuiqsut, Barrow, and Atqasuk in the Teshekpuk Lake Special Area.

#### **A.2.4.2 Evaluation of the Availability of Other Lands for Oil and Gas Exploration and Development**

The NPRPA, as amended, gave the Secretary of the Interior the authority to conduct oil and gas leasing in the Northeast NPR-A. However, the law prohibited petroleum production from occurring in NPR-A until authorized by Congress. In 1980, Congress granted that authorization and directed the Secretary of the Interior to undertake a program of competitive leasing of potential oil and gas tracts in the Reserve. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska."

BLM is undertaking this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy as well as BLM's responsibilities to manage these lands under authority of the NPRPA and FLPMA and other authorities cited elsewhere in this EIS. Alternative D would continue the authorization of oil and gas exploration or development activities in the Northeast NPR-A under performance-based stipulations and ROPs identified in **section 2.7**,



***Stipulations and Required Operating Procedures*** of the Supplemental IAP/EIS. Other lands managed by the BLM are either too remote for economically viable oil and gas production, or have a low probability of containing sufficient quantities of oil or gas. State and Native Corporation Lands cannot be considered in a BLM plan, and other BLM lands outside of Alaska are not considered under ANILCA as per BLM Policy.

#### **A.2.4.3 Evaluation of Other Alternatives that would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes**

Alternatives that would reduce or eliminate the use of public lands needed for subsistence include: 1) making more land in the Northeast NPR-A unavailable for oil and gas leasing, or 2) not allowing oil and gas activity to occur. However, neither of these alternatives would satisfy the underlying purpose of the IAP/EIS to make more lands available for leasing. The Secretary of the Interior has directed BLM to consider additional lands in the Northeast NPR-A to the extent it can be done in an environmentally sound manner. Reducing the number of acres available for energy development would contradict this direction, and would go against the President's stated National Energy Policy. Additionally, the 1998 Northeast IAP/EIS ROD allowed the BLM to enter into contracts with several oil companies, by leasing land for oil and gas exploration. All of these leases are still in effect. ***Section 2.5, Alternatives Considered but Eliminated from Detailed Analysis of the Supplemental IAP/EIS*** discusses other alternatives that were considered, but eliminated from detailed analysis.

#### **A.2.4.4 Findings**

Alternative D would not significantly restrict subsistence use by the communities of Anaktuvuk Pass, Atkasuk, Barrow, Wainwright and Nuiqsut. The impacts to subsistence resources would be minimal, even though displacement of the Teshekpuk Lake Herd could occur. Impacts to the subsistence user, including access, comprise the greatest potential impact, however, adequate protective measures have been incorporated, including the deferral of leasing for ten years in the area north of Teshekpuk Lake, the limited amount of acres available for leasing in the seven new lease tracks north of Teshekpuk Lake, making Teshekpuk Lake unavailable for leasing, specific procedures for subsistence consultation with directly affected subsistence communities, and requirements for extensive studies of caribou movement, to ensure that significant restrictions to subsistence uses and needs would not occur. While the subsistence user may be impacted by development within the planning area as a result of hunter avoidance of facilities and infrastructure, the requirements to hold workshops to discuss the placement of allowed permanent facilities within key caribou habitat proposed allowable use under Alternative D does not restrict or otherwise limit in any way subsistence harvesting near infrastructure or facilities.

#### **A.2.5 Evaluation and Findings for the Cumulative Case**

The goal of the cumulative analysis is to evaluate the incremental impact of the current action in conjunction with all past, present, and reasonably foreseeable future actions in or near the planning area. The cumulative analysis considers in greatest detail activities that are more certain to happen, and activities that were identified as being of great concern during scoping. Oil and gas activities considered in the analysis include past development and production, present development, reasonably foreseeable future development, and speculative development. Activities not associated with oil and gas are also considered. All reasonably foreseeable future activities that may contribute to cumulative effects are considered in this analysis.



Actions included in the cumulative analysis include, but are not limited to the following:

- Offshore exploration and development in the Beaufort and Chukchi seas;
- Currently-producing fields/developments (Prudhoe Bay, Kuparuk, Alpine, Meltwater);
- Possible future developments, including the increased likelihood of development in Northwest NPR-A;
- Additional lease sales both on State of Alaska lands and in the Northwest NPR-A;
- The continuation of exploration on current leases in the Northeast NPR-A and additional lease sales in this same area; and
- Gas Development on the North Slope.

Moreover, these actions are considered in light of the shifting environmental conditions presented by climate change.

#### **A.2.5.1 Evaluation of the Effect of Such Use, Occupancy, or Disposition on Subsistence Uses and Needs**

**Section 4.7, *Effects of the Cumulative Case*** of the Supplemental IAP/EIS contains a detailed description of the cumulative-case scenario, including past effects, present effects, and the future possible oil field and infrastructure development that this evaluation uses. This assessment and finding assumes that all future development in the NPR-A would be subject to the stipulations and ROPs proposed in the Supplemental IAP/EIS. The cumulative analysis expands the area of potential impact beyond the planning area, to the entire North Slope Borough. Additionally, the impacts to subsistence use of migratory species, such as waterfowl, are also discussed.

The analysis of the effects of the cumulative case on subsistence presented in **section 4.7.7.12, *Analysis of Cumulative Effects by Resources, Subsistence*** indicates that cumulative activity on the North Slope has the potential to significantly restrict subsistence use for the communities of Anaktuvuk Pass, Atkasuk, Barrow, Wainwright and, especially, Nuiqsut. Foreseeable development in the Northeast NPR-A could extend from the Colville River Delta north of Nuiqsut to an area southwest of the village, which would effectively encircle the community, making it necessary for subsistence hunters traveling in nearly every direction to pass through some kind of development on the way to subsistence harvest areas. Because Iñupiat hunters are reluctant to use firearms near oil production facilities and pipelines, there would be a perceived barrier to harvest in these areas. Subsistence users currently avoid the Kuparuk and Meltwater areas because of the physical barriers pipelines and elevated gravel roads pose to winter snowmachine travel, and have expressed concerns about hunting close to oil production and processing facilities because of perceived regulatory barriers (ENSR 2004). Additionally, many community members fear contamination of their subsistence resources by oil production facilities.

Subsistence resources also have the potential to be impacted under the cumulative case. As stated in **section 4.7.7.9:**

Cumulative effects on caribou distribution and abundance are likely to be long-term, lasting as long as the life of the oil fields. Any reduction in the calving and summer habitat use by cows and calves from future onshore leasing would represent a functional loss of habitat that could result in long-term effects on the caribou herds' productivity and abundance.



The effects of oil and gas activities in the NPR-A would be greatest on those herds that use the planning area, specifically the Teshekpuk Lake and the Western Arctic herds. Currently, the Teshekpuk Lake Herd is the primary source of caribou for the communities of Anaktuvuk Pass, Atkasuk, Barrow, Nuiqsut, and Wainwright. Any substantial decrease in the population numbers of this herd would have a substantial impact on all five communities. If the decrease occurred during times of unsuccessful bowhead whaling, the effects would be devastating for Atkasuk, Barrow, Nuiqsut, and Wainwright. The additional development pressure envisioned by the cumulative-case scenario could exacerbate changes in abundance and productivity of caribou, and these changes could, in turn, adversely affect subsistence harvests.

Impacts to migratory waterfowl, especially brant, have the potential to negatively affect subsistence hunters in the Southwest Region of Alaska, especially in the Yukon-Kuskokwim Delta (Y-K Delta). According to the Alaska Department of Fish and Game Community Profile Database, communities in this area are some of the largest users of migratory waterfowl, especially during the springtime, with this resource comprising between 1.6% to as much as 6.2% of their annual yearly harvest, depending on the community. The analysis of impacts to migratory waterfowl indicate that while there is the potential for there to be negative effects as a result of both non-oil and gas and oil and gas activity, these effects are primarily dependent upon loss of habitat as a result of construction activity. Given the fact that brant are the primary species of concern for the Y-K Delta and comprise only one portion of their migratory bird harvest (at most 3% of total bird harvest, according to ADF&G), potential impacts as a result of this plan do not constitute a significant restriction of subsistence use for residents in that area of the state.

If a large discovery is made in the northwest or northern part of the planning area, it could make additional developments in the Northwest NPR-A or adjacent offshore areas more economically feasible, resulting in additional habitat and disturbance related impacts in the Northwest and Northeast NPR-A and in offshore areas adjacent to the Northeast and Northwest NPR-A. As development or disturbance increases, so does the potential for negative impacts to subsistence species and users. The offshore development and transport that is possible under the cumulative case could result in oil spills in the marine environment. Any oil spill that tainted, or was perceived to taint, whales or other marine mammals of importance to subsistence users would have a significant negative effect on those users. If such a spill affected migration patterns or distributions of any marine mammal used for subsistence, it would also have significant negative effect on subsistence users.

Effects on subsistence harvest patterns from natural gas development and production could occur from natural gas blowouts, noise and traffic disturbance, and construction activities under any of the alternatives. Subsistence hunters, who already tend to avoid oil field infrastructure, may be even more likely to avoid aboveground gas pipelines for fear of a blowout. Noise and disturbance activities due to the development of a gas field, especially to caribou, would be local (within 3-4 km of the pipeline corridor) but would persist for the life of the field.

From 1990 to 1997, the North Slope's permanent population grew at an annual rate of 2.7%, and Nuiqsut was the fastest growing village. For analysis purposes, however, the Supplement assumes that the population would grow for approximately the next 40 years at a rate of approximately 2% per year and then level off, with or without the development envisioned in the cumulative scenario discussed. The effects of such growth on competition for subsistence resources are difficult to predict, but it is possible that over time there would be increased competition among local subsistence users. It is unlikely that the transient workers associated



with oil and gas development would add to the competition, because they are ineligible for the subsistence priority under existing Federal regulations.

The effects of global climate change on marine mammals are unclear, but may result in more ship traffic in the Beaufort over a longer ice-free season, commercial fisheries in the Chukchi and Beaufort, and displacement and distributional changes if not population changes among marine mammals. Climate change is likely to have the greatest influence on marine mammal populations in and adjacent to the planning area; however, species resilience and resilience as well as feedback and interactions remain highly uncertain. Estimating how the incremental addition of direct human activities (disturbance, hunting and habitat alteration) remains speculative but climate change by itself is likely to have significant effects on the marine mammal community of the Beaufort and Chukchi Seas.

#### **A.2.5.2 Evaluation of the Availability of Other Lands for Oil and Gas Exploration and Development**

The NPRPA, as amended, gives the Secretary of the Interior the authority to conduct oil and gas leasing in the NPR-A. However, the law prohibited petroleum production from occurring in the NPR-A until authorized by Congress. In 1980, Congress granted that authorization and directed the Secretary of the Interior to undertake a program of competitive leasing of potential oil and gas tracts in the Reserve. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska." BLM is undertaking this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy as well as BLM's responsibilities to manage these lands under authority of the NPRPA and FLPMA and other authorities cited elsewhere in this Supplemental IAP/EIS. Other lands managed by BLM are either too remote for economically viable oil and gas production, or have a low probability of containing sufficient quantities of oil or gas. State and Native Corporation Lands cannot be considered in a BLM plan, and other BLM lands outside of Alaska are not considered under the ANILCA as per BLM Policy.

#### **A.2.5.3 Evaluation of Other Alternatives that would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes**

Alternatives that would reduce or eliminate the use of public lands needed for subsistence include: 1) making more land in the Northeast NPR-A unavailable for oil and gas leasing, or 2) not allowing oil and gas activity to occur. However, neither of these alternatives would satisfy the underlying purpose of the IAP/EIS to make more lands available for leasing. The Secretary of the Interior has directed BLM to consider additional lands in the Northeast NPR-A to the extent it can be done in an environmentally sound manner. Reducing the number of acres available for energy development would contradict this direction, and would go against the President's stated National Energy Policy. Additionally, the 1998 Northeast IAP/EIS ROD allowed the BLM to enter into contracts with several oil companies, by leasing land for oil and gas exploration. All of these leases are still in effect. **Section 2.5, *Alternatives Considered but Eliminated from Detailed Analysis of the Supplemental IAP/EIS*** discusses other alternatives that were considered, but eliminated from detailed analysis.

#### **A.2.5.4 Findings**

The cumulative case as presented in this analysis, when taken in conjunction with all action alternatives, would result in a reasonably foreseeable and significant restriction of subsistence



use for the communities of Anaktuvuk Pass, Atqasuk, Barrow, Nuiqsut, and Wainwright, due to a decrease in resource abundance, significant alteration in the distribution of resources, and a significant restriction on the access of subsistence users. This finding requires a positive determination pursuant to the ANILCA § 810.

The distribution of caribou populations on the North Slope has been affected by Prudhoe Bay development, and access to subsistence resources has been compromised there. Although procedures will be in place to ensure that future development affects access as little as possible, it is still probable the total area available for subsistence purposes will be reduced. If a major marine oil spill were to occur in the future, it could significantly affect both populations and distributions of fish, and whales and other marine animals, causing significant restrictions to subsistence resources. Oil and gas infrastructure located in core caribou calving or insect-relief areas would result in the displacement, and possible reduction, of the herd. Population growth would result in a greater number of residents relying on local resources to meet their needs. These restrictions have the potential to affect Anaktuvuk Pass, Barrow, Wainwright, Atqasuk, and Nuiqsut.

### **A.3 Notice and Hearings**

ANILCA § 810(a) provides that no “withdrawal, reservation, lease, permit, or other use, occupancy or disposition of the public lands which would significantly restrict subsistence uses shall be effected” until the federal agency gives the required notice and holds a hearing in accordance with ANILCA § 810(a)(1) and (2). BLM provided notice in the Federal Register that it made positive findings pursuant to ANILCA § 810 that the cumulative case presented in the Supplemental IAP/EIS, when taken in conjunction with all action alternatives, met the “may significantly restrict” threshold. As a result, public hearings were held in the potentially affected communities of Anaktuvuk Pass, Atqasuk, Nuiqsut, Wainwright and Barrow. Notice of these hearings were in the Federal Register and by way of the local media, including the Arctic Sounder newspaper, and KBRW, the local Barrow radio station with coverage to all villages on the North Slope.

### **A.4 Subsistence Determinations Under ANILCA § 810(a)(3)(A), (B), and (C)**

ANILCA § 810(a) provides that no “withdrawal, reservation, lease, permit, or other use, occupancy or disposition of the public lands which would significantly restrict subsistence uses shall be effected” until the federal agency gives the required notice and holds a hearing in accordance with ANILCA § 810(a)(1) and (2), and makes the three determinations required by ANILCA § 810(a)(3)(A), (B), and (C). The three determinations that must be made are: 1) that such a significant restriction of subsistence use is necessary, consistent with sound management principles for the utilization of the public lands; 2) that the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other such disposition; and 3) that reasonable steps will be taken to minimize adverse impacts to subsistence uses and resources resulting from such actions [16 U.S.C. § 3120(a)(3)(A), (B), and (C)].

The BLM has found in this subsistence evaluation that the cumulative case considered in this Supplemental IAP/EIS would significantly restrict subsistence uses. Therefore, BLM undertook



the notice and hearing procedures required by ANILCA § 810 (a)(1) and (2) in conjunction with release of the Draft Supplemental IAP/EIS in order to solicit public comment from the potentially affected communities and subsistence users.

The determinations below satisfy the requirements of ANILCA § 810(a)(3)(A), (B), and (C).

#### **A.4.1 Significant Restriction of Subsistence Use is Necessary, Consistent with Sound Management Principles for the Utilization of Public Lands.**

The BLM has prepared this Supplemental IAP/EIS to fulfill the mandates of the President's energy policy and the responsibility to manage the National Petroleum Reserve – Alaska under the authority of two laws passed in 1976—The Naval Petroleum Reserves Production Act (NPRPA) and the Federal Land Policy and Management Act (FLPMA). The President's energy policy directs the Secretary of the Interior to “consider additional environmentally responsible oil and gas development, based on sound science and the best available technology.” The NPRPA authorizes and directs the Secretary of the Interior to “further explore, develop and operate” the National Petroleum Reserve-Alaska (10 U.S.C. § 7421). At the same time, the statute also requires that all oil and gas activities “undertaken pursuant to this section shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources” of the National Petroleum Reserve – Alaska (42 U.S.C. § 6506a).

It was in furtherance of these objectives, together with other management guidance found in the NPRPA, FLPMA, NEPA, and ANILCA that this Supplemental IAP/EIS was undertaken. After considering a broad range of alternatives, a Preferred Alternative was developed that serves to make available additional lands for environmentally responsible oil and gas exploration and development after a ten-year deferral period, while incorporating protective measures that serve to minimize impacts to important subsistence resources and subsistence-use areas. The resulting Preferred Alternative considers the necessity for economically feasible development while providing effective protections to minimize any impacts on subsistence resources and uses. Under the Preferred Alternative, the performance-based stipulations and ROPs which accompany the Preferred Alternative serve as the primary mitigation measures to be used to reduce the impact of the proposed activity on subsistence resources.

The BLM has considered and balanced a variety of factors with regard to the proposed activity on public lands, including, most prominently, the comments received during the public meetings and hearings which stressed the importance of protecting essential caribou movement/migration corridors located to the east of Teshekpuk Lake. The BLM has determined that the significant restriction that may occur under the Preferred Alternative when considered together with all the possible impacts of the cumulative case, is necessary, consistent with sound management principles for the use of these public lands, and for BLM to fulfill the management goals for the Planning Area as guided by the statutory directives in the NPRPA, FLPMA, and other applicable laws.

#### **A.4.2 The Proposed Activity will Involve the Minimal Amount of Public Lands Necessary to Accomplish the Purposes of such Use, Occupancy or Other Disposition.**

The BLM has determined that the Preferred Alternative involves the minimal amount of public lands necessary to accomplish the purposes of the Preferred Alternative—which is to make additional lands available for oil and gas leasing in the Northeast National Petroleum Reserve –



Alaska. Alternatives that varied between opening no additional lands, some additional lands, or all lands to leasing were analyzed. The Preferred Alternative allows leasing after a ten-year deferral period in areas near Teshekpuk Lake and on the seven new large lease tracts north of the lake that have a limited amount of acres available for surface occupancy. In addition, Teshekpuk Lake and the islands contained within the lake would be unavailable for oil and gas leasing.

#### **A.4.3 Reasonable Steps will be Taken to Minimize Adverse Impacts upon Subsistence Uses and Resources Resulting from such Actions.**

When BLM began its NEPA scoping process for the current supplemental plan, it internally identified subsistence as one of the major issues to be addressed. The information found within the analysis of impacts to subsistence, including access, harvests, and traditional use patterns, as well as the results of public scoping meetings in the villages of the North Slope, meetings with the National Petroleum Reserve – Alaska Subsistence Advisory Panel, and consultation with tribal and local governments (especially the North Slope Borough, a cooperating agency), were used to craft the Preferred Alternative. In addition, the BLM took into consideration comments from villages and individuals of the North Slope during the ANILCA Subsistence Hearings. This information resulted in several modifications to the draft Alternative D, and resulted in the Preferred Alternative. These modifications include:

- Deferring leasing in 9% (430,000 acres) of the planning area for ten years after the signing of the Record of Decision;
- Making Teshekpuk Lake and its islands unavailable for oil and gas leasing, rather than deferring leasing in this area indefinitely;
- Allowing only up to 300 acres of total disturbance as a result of permanent oil and gas facilities in each of the seven new large lease tracts north of Teshekpuk Lake, which will be available after the ten-year deferral period should the existing NEPA analysis be adequate;
- Restricted Occupancy Zones—including approximately 240,000 acres north of Teshekpuk Lake, 45,000 acres east of the lake, 9,700 acres northwest of the lake, and 240,000 acres south of the lake—all of which serve to protect goose molting and caribou insect-relief habitat, caribou migration corridors, and caribou calving areas;
- Stipulations H-1 and H-2, which require additional consultation/notification efforts by the oil industry to potentially affected communities; and
- Stipulation K-5, which requires a 4-year study of caribou movements to be used in the design of permanent facilities; and Stipulations K-9 and K-10, which require workshops to be held to determine the best location of proposed pipeline corridors so as to minimize impacts to caribou.

Given these steps, as well as the other performance-based stipulations and ROPs the BLM has determined that the Preferred Alternative includes reasonable steps to minimize adverse impacts on subsistence uses and resources.



## **Appendix B: Federal, State, and Local Permits and/or Approvals for Oil and Gas Exploration, Development, and Production Activities**







## Appendix B

# Federal, State, and Local Permits and/or Approvals for Oil and Gas Exploration, Development, and Production Activities

The following table summarizes permit and other requirements that must be met before oil and gas exploration or development activities may occur. Some obligations would be placed directly on the applicant. Others would be required of Federal agencies prior to granting authorizations to oil and gas companies.

Regulatory Agency	Permit/Approval Actions/Requirements
<b>FEDERAL</b>	
<b>U.S. Army Corps of Engineers (USACE)</b>	<ul style="list-style-type: none"> <li>• Issues a Section 404 permit under the Federal Water Pollution Control Act of 1972, as amended (Clean Water Act; 33 USC § 1344) for discharge of dredged and fill material into waters of the U.S, including wetlands.</li> <li>• Issues a Section 10 permit under the Rivers and Harbors Appropriations Act of 1899 (33 USC § 403) for structures or work in, of affecting, navigable waters of the U.S.</li> <li>• Issues a Section 103 Ocean Dumping permit under Section 103 of the Marine Protection Research and Sanctuaries Act of 1972 (33 USC § 1413) for transport of dredged material for ocean disposal.</li> </ul>
<b>U.S. Environmental Protection Agency (USEPA)</b>	<ul style="list-style-type: none"> <li>• Issues a National Pollutant Discharge and Elimination System (NPDES) permit under Section 402, Federal Water Pollution Control Act of 1972, as amended (Clean Water Act; 33 USC § 1342) for discharges into waters of the U.S.</li> <li>• Issues an Underground Injection Control Class 1 Industrial Well permit under the Safe Drinking Water Act (42 USC §§ 300f et seq.; 40 CFR parts 144 and 146) for underground injection of Class I (industrial) waste materials.</li> <li>• Requires a Spill Prevention Containment and Countermeasure (SPCC) Plan under Section 311 of the Federal Water Pollution Control Act of 1972, as amended (Clean Water Act; 33 USC § 1321; 40 CFR part 112) for storage of over 660 gallons of fuel in a single container or over 1,320 gallons in aggregate in tanks above ground.</li> <li>• Conducts a review and evaluation of the Draft and Final EIS for compliance with CEQ guidelines (40 CFR parts 1500-1508) and Section 309 of the Clean Air Act (42 USC § 7609).</li> <li>• Authority delegated to ADEC to issue air quality permits for facilities operating within state jurisdiction, including a Title V operating permit and a Prevention of Significant Deterioration (PSD) permit under the Clean Air Act, as amended (42 USC §§ 7401 et seq.), to address air pollutant emissions.</li> </ul>



Regulatory Agency	Permit/Approval Actions/Requirements
<b>National Oceanic and Atmospheric Administration (NOAA) Fisheries Service (formerly National Marine Fisheries Service [NMFS])</b>	<ul style="list-style-type: none"> <li>• Provides consultation under the Endangered Species Act of 1973, Section 7(a)(2) regarding effects to threatened or endangered species.</li> <li>• Provides consultation under the Magnuson-Stevens Fishery Management and Conservation Act for effects on Essential Fish Habitat.</li> <li>• Provides consultation under the Fish and Wildlife Coordination Act regarding effects on fish and wildlife resources.</li> <li>• Provides consultation under the Marine Mammal Protection Act regarding effects on marine mammals.</li> <li>• Issues Incidental Harassment Authorization under the Marine Mammal Protection Act for incidental takes of protected marine mammals (bowhead whales and ringed seals).</li> </ul>
<b>U.S. Department of the Interior, Bureau of Land Management (USDOI BLM)</b>	<ul style="list-style-type: none"> <li>• Reviews and approves Applications for Permit to Drill (including drilling plans and surface-use plans of operations) and Subsequent Well Operations as prescribed in 43 CFR part 3160, under authority of the Naval Petroleum Reserves Production Act of 1976 (42 USC §§ 6501-6508) and other Federal laws, for development and production of Federal leases.</li> <li>• Approves lease administration requirements including Unit Agreements and Plans of Development, Communitization Agreements, and Participating Area Determinations, as described in 43 CFR parts 3130 and 3180, under the Mineral Leasing Act of 1920 (30 USC §§ 181 et seq.), Federal Oil and Gas Royalty Management Act of 1982 (43 USC §§ 1701 et seq.), Naval Petroleum Reserves Production Act of 1976, Department of the Interior Appropriations Act, Fiscal Year 1981(Public Law 96-514), and other Federal laws, for exploration and development of oil and gas leases.</li> <li>• Issues geophysical permits to conduct seismic activities as described in 43 CFR part 3150, under authority of the Mineral Leasing Act of 1920, Alaska National Interest Lands Conservation Act (16 USC §§ 3101 et seq.), Federal Land Policy and Management Act of 1976 (43 USC §§ 1701 et seq.), Naval Petroleum Reserves Production Act of 1976, and Department of the Interior Appropriations Act, Fiscal Year 1981.</li> <li>• Issues rights-of-way grants and temporary use permits for the construction, operation, and maintenance of pipeline, production, and related facilities under the Naval Petroleum Reserves Production Act of 1976.</li> <li>• Delegates authority to ADEC for review and approval of Oil Discharge Prevention and Contingency Plans and Certification of Financial Responsibility for accidental oil discharge into navigable waters under Section 1016 of the Oil Pollution Act of 1990 (OPA90; 33 USC § 2716), and Section 311(j)(5) of the Federal Water Pollution Control Act (33 USC § 1321(j)(5); 30 CFR part 254).</li> </ul>



Regulatory Agency	Permit/Approval Actions/Requirements
U.S. Fish and Wildlife Service (USFWS)	<ul style="list-style-type: none"> <li>• Provides consultation under the Endangered Species Act of 1973, Section 7(a)(2) regarding effects to threatened or endangered species.</li> <li>• Provides consultation under the Fish and Wildlife Coordination Act regarding effects to fish and wildlife resources.</li> <li>• Issues a Letter of Authorization under the Marine Mammal Protection Act for incidental takes of marine mammals.</li> </ul>
STATE	
Alaska Department of Environmental Conservation (ADEC)	<ul style="list-style-type: none"> <li>• Issues a Certificate of Reasonable Assurance for discharge of dredged and fill material into U.S. waters under Section 401, Federal Water Pollution Control Act of 1972, as amended in 1977 (Clean Water Act; 33 USC § 1341); AS 46.03.020; 18 AAC chapters 15, 70, and 72.</li> <li>• Issues a Certificate of Reasonable Assurance/NPDES and Mixing Zone Approval for wastewater disposal into all state waters under Section 402, Federal Water Pollution Control Act of 1972, as amended (Clean Water Act; 33 USC § 1342); AS 46.03.020, .100, .110, .120, and .710; 18 AAC chapters, 10, 15, and 70, and ; § 72.500.</li> <li>• Issues a Class I well wastewater disposal permit for underground injection of non-domestic wastewater under AS 46.03.020, .050, and .100.</li> <li>• Reviews and approves all public water systems including plan review, monitoring program, and operator certification under AS 46.03.020, .050, .070, and .720, 18 AAC § 80.005.</li> <li>• Approves domestic wastewater collection, treatment, and disposal plans for domestic wastewaters (18 AAC chapter 72).</li> <li>• Approves financial responsibility for cleanup of oil spills (18 AAC chapter 75).</li> <li>• Reviews and approves the Oil Discharge Prevention and Contingency Plan and the Certificate of Financial Responsibility for storage or transport of oil under AS 46.04.030 and 18 AAC chapter 75. The State review applies to oil exploration and production facilities, crude oil pipelines, oil terminals, tank vessels and barges, and certain non-tank vessels.</li> <li>• Issues a Title V Operating Permit and a PSD permit under Clean Air Act Amendments (Title V) for air pollutant emissions from construction and operation activities (18 AAC chapter 50).</li> <li>• Issues solid waste disposal permit for state lands under AS 46.03.010, 020, 100, and 110; AS 46.06.080; 18 AAC § 60.005; and 200.</li> <li>• Reviews and approves solid waste processing and temporary storage facilities plan for handling and temporary storage of solid waste on Federal and state lands under AS 46.03.005, 010, and 020; and 18 AAC § 60.430.</li> <li>• Approves the siting of hazardous waste management facilities.</li> </ul>



Regulatory Agency	Permit/Approval Actions/Requirements
<b>Alaska Oil and Gas Conservation Commission (AOGCC)</b>	<ul style="list-style-type: none"> <li>• Issues a Permit to Drill under 20 AAC § 25.05.</li> <li>• Issues approval for annular disposal of drilling waste (20 AAC § 25.080).</li> <li>• Authorizes Plugging, Abandonment, and Location Clearance (20 AAC § 25.105 through 25.172).</li> <li>• Authorizes Production Practices (20 AAC §§ 25.200 through 25.245).</li> <li>• Authorizes Class II Waste Disposal and Storage (20 § AAC 25.252).</li> <li>• Approves Workover Operations (20 § AAC 25.280).</li> <li>• Reports (20 AAC §§ 25.300 through 25.320).</li> <li>• Authorizes Enhanced Recovery Operations under 20 AAC §§ 25.402-460.</li> </ul>
<b>Alaska Department of Natural Resources (ADNR)</b>	<ul style="list-style-type: none"> <li>• Conducts a Coastal Zone Consistency review and issues determination of consistency of proposed development within the coastal zone under Coastal Zone Management Act of 1972, as amended in 1976 (16 USC §§ 1451 et seq.); Alaska Coastal Management Program Act of 1977 (AS 46.40); and 6 AAC chapter 50.</li> <li>• Issues a Material Sales Contract for mining and purchase of gravel from state lands under AS 38.05.850; and 11 AAC §§ 71.070 and .075.</li> <li>• Issues Rights-of-Way (ROW) and Land Use permits for use of state land, ice road construction on state land, and state freshwater bodies under AS 38.05.850.</li> <li>• Issues a Temporary Water Use and Water Rights permit under AS 46.15 for water use necessary for construction and operations.</li> <li>• Issues pipeline ROW leases for pipeline construction and operation across state lands under AS 38.35.020.</li> <li>• Issues a Cultural Resources Concurrence for developments that may affect historic or archaeological sites under the National Historic Preservation Act of 1966, as amended (16 USC §§ 470 et seq.), Alaska Historic Preservation Act (AS 41.35.010 through .240).</li> <li>• Issues Fish Habitat Permits under AS 41.14.840 and AS 41.14.870 for activities within streams used by fish that agency determines could represent impediments to fish passage, or for travel in, excavation of, or culverting of anadromous fish streams. (Authority to issue Fish Habitat permits moves to the Alaska Department of Fish and Game in the summer of 2008.)</li> </ul>
<b>BOROUGH</b>	
<b>North Slope Borough (NSB)</b>	<ul style="list-style-type: none"> <li>• Issues a Coastal Zone Consistency Determination to address project planning or development within the coastal zone under the Coastal Zone Management Act of 1972, as amended in 1976; Alaska Coastal Management Program, 1977 (AS 46.40); Borough Ordinance 90-39.</li> <li>• Issues Development Permits for oil and gas projects under NSB Code of Ordinance Title 19.</li> </ul>



## **Appendix C: Esσηςntial Fish Habitat**







## Appendix C

# Essential Fish Habitat Assessment

### Regulatory Background

The 1996 Sustainable Fisheries Act enacted additional management measures to protect commercially harvested fish species from overfishing. Along with reauthorizing the Magnuson-Stevens Fishery Conservation and Management Act Reauthorization (16 U.S.C. 1801-1882), one of those added measures is to describe, identify, and minimize adverse effects to Essential Fish Habitat (EFH). The regulations defining EFH are in 50 CFR Part 600. EFH is defined as habitat necessary to the species for spawning, breeding, feeding, or growth to maturity (i.e. all life stages). Those habitats include: aquatic areas and their associated physical, chemical, and biological properties that are used by fish; sediment, hard bottom, and structures underlying the waters; and associated biological communities. Potentially impacting activities may have effects on essential fish habitats that are direct (e.g. physical disruption) or indirect (e.g. loss of prey species). Those effects can be site-specific, habitat-wide, cumulative, and/or synergistic.

In 2005, a Final Environmental Impact Statement (EIS) for EFH in Alaska was issued by the National Marine Fisheries Service and the North Pacific Fishery Management Council (NMFS and NPFMC 2005). This included a decision on how EFH should be identified and a current description of these habitats by species based on the preferred alternative. The only EFH designated in the Northeast NPR-A Planning area is for salmon. This includes all five species of Pacific salmon: chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), sockeye (*O. nerka*), and chum (*O. keta*).

Federal agencies are required to consult with the NOAA Fisheries Service (National Marine Fisheries Service) on activities, including non-oil and gas activities and oil and gas leasing and development that may adversely affect the essential fish habitat. This consultation should be consolidated with environmental review required by other statutes, such as the National Environmental Policy Act (50 CFR 600.920(e)).

### Salmon EFH

Generally, there is little evidence of viable, self-sustaining salmon populations in the Beaufort and the northern (north of 70° N. latitude) Chukchi Sea. Present salmon “populations” have a very difficult time establishing and persisting in the Arctic, most likely because of the marginal habitats (Craig 1989a; Fechhelm and Griffiths 2001). Conclusions based on a survey of available information describing salmon stocks in the Beaufort Sea (Fechhelm and Griffiths 2001) indicate only a few isolated spawning stocks of chum and pink salmon that might occur in the region, primarily the Sagavanirktok and Colville rivers. Small runs of pink and chum salmon have been noted in the Colville River (Bendock 1979b, McElderry and Craig 1981) and in recent years these species have been taken in the Colville and Itkillik rivers as part of the fall subsistence fishery (George 2004). However, catches in scientific sampling and in the subsistence fishery are extremely low (Pedersen and Shishido 1988 in Craig 1989b; Moulton 1994, 1995, 1996b, 1997) and no known spawning sites have been identified for these species. Chinook, coho, and sockeye



salmon are even rarer than pink and chum salmon in the region. The salmon populations in and adjacent to the Planning Area can be considered marginal.

The preferred alternative selected in the NMFS and NPFMC EIS (2005) determines that:

“For salmon FMP (Fishery Management Plan) species, the analysis is broken into three parts: marine, nearshore, and freshwater. Marine and nearshore salmon EFH is generally described to include all marine waters from the mean higher tide line to the limits of the EEZ (Exclusive Economic Zone) since science recognizes that salmon are 1) distributed throughout all marine waters during late juvenile and adult life stages and 2) found nearshore and along coastal migration corridors as early juvenile life stages out-migrate and adult life stages return to and from freshwater areas, respectively. Freshwater areas used by egg, larvae, and returning adult salmon will be analyzed as those areas indexed in ADF&G’s *Catalogue of Waters Important for the Spawning*, Appendix D Final EFH EIS – April 2005 D-48 *Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a), specifically Pacific salmon species. Freshwater salmon systems are generally defined as those areas above mean higher tide to the upper limits of those freshwater systems supporting salmon and may include contiguous wetland areas, such as those areas hydrologically connected to the main water source via access channels to an adjacent river, stream, lake, pond, etc.” (page D-47).

Although the EIS identifies the 1998 version of ADF&G’s *Catalogue of Waters Important for the Spawning*, there is more current information regarding the distribution of anadromous fish in Alaska, available on the worldwide web (ADFG 2005; Johnson et al. 2004). This updated version is utilized for the purpose of this analysis (April 10, 2007).

In the planning area, the Colville River (330-00-10700), Ublutuoch River (330-00-10840-2017), Fish Creek (330-00-10840), Judy Creek (330-00-10840-2043), and Ikpikpuk River (330-00-10900) meet this criterion. A brief description of habitats utilized by salmon at various life stages follows. More details on habitat in the planning area is discussed in section 3.3.5 Fish.

Freshwater overwintering habitat, including spawning gravel that does not freeze and kill spawned fish eggs, is extremely limited in the northeast Chukchi Sea coast area and probably is the largest controlling factor limiting the viability of northern Chukchi Sea salmon stocks at present (Craig 1989a; Fechhelm and Griffiths 2001). Most benthic invertebrates, such as insects living on streambeds and insects and zooplankton living in the water column, are freshwater prey for one or another salmon species.

For salmon, freshwater spawning areas are also the egg and larvae habitat for up to 11 months after spawning. Juveniles of pink and chum salmon, the most common and most adapted salmon to the northeastern Chukchi Sea environment, do not require juvenile freshwater rearing habitat because the young hatch in early spring and migrate soon after to saltwater. Coho, sockeye, and king salmon require year-round juvenile rearing habitat for 1 to 3 years. Sockeye typically require freshwater lake rearing habitat for up to 2 years.

The nearshore (estuarine) zone is used primarily by juvenile salmon smolt during physiological adaptation from the freshwater to the saltwater environment. This outmigration takes place from the time the ice moves out through August. Feeding during this time, especially in the first few days, is thought to be especially critical to survival. Thus, prey and prey habitat are an important



part of this particular habitat. Additionally, adults returning to spawn will transit the estuarine zone and may wait there while their osmoregulatory system adapts from saltwater to freshwater. Individual fish probably take only a few days to a week to transit this estuarine area.

The marine juvenile and adult stages are the principal growth periods of salmon and can last from 1 to 6 years. During this period, prey and prey habitat are the most critical components of the marine essential fish habitat. Prey commonly consists of animals near the water surface (epipelagic zooplankton), particularly copepods. Chinook salmon and larger sockeye, coho, and chum salmon also consume fish. There appears to be very limited use of the northern Chukchi Sea or Beaufort Sea for these stages.

Besides redefining the way that EFH is identified in Alaska, the NMFS and NPFMC EIS (2005) also established an approach to identify Habitat Areas of Particular Concern (HPACs) within EFH. This designation for particularly critical habitats already existed, but the EIS officially adopted a new approach for HPACs. The preferred alternative stated:

“...the existing HAPC identifications would be rescinded, and the Council would adopt an approach that would allow specific sites within EFH, selected to address a particular problem, to be identified as HAPCs in the future.” (ROD page 2).

In general, this was a shift from viewing HPACs as broad habitat types to a site-based approach in order to better accomplish management objectives.

Ecologically, the Beaufort Sea and northern Chukchi Sea can be considered a population sink for salmon rather than a source, drawing excess salmon from other areas rather than producing a surplus that colonizes new areas. The scarcity of salmon documented in the Beaufort Sea and the fact that it is close to the northern boundary of the geographic distribution support the population sink theory.

Recent occurrences raise the question of whether significant temperature increases in the Arctic caused by climate change could lead to a significant change in salmon distribution in the future. Higher salmon catches off of Point Barrow in recent years (personal communication with Craig George, 2006) indicates an increase in the number of salmon moving through the northern Chukchi Sea. Additionally, local residents living near the Beaufort Sea have noticed increases in salmon occurrences over the past 10 to 20 years (Pedersen 1995; Napageak 1996). Several published journal notes of first records of salmon in the Canadian Beaufort Sea that occurred in the past decade (Babaluk et al. 2000) also indicate the increasing, but still rare, incidence of salmon in the Beaufort Sea.

### **Action, Potential Effects on EFH, and Mitigation**

The actions covered by this EFH analysis are thoroughly described within chapter 2 of this IAP/EIS. In general, the focus is on oil and gas exploration and development activities, including associated infrastructure, various scenarios of development, and oil spills. However, non-oil and gas activities are also considered.

Potential effects on salmon EFH from oil and gas activities (and non oil and gas activities) in the NE NPR-A Planning Area are the same as those described for other fish habitat in chapter 4, environmental consequences. Most alternatives provide similar guidelines for protection, whether in the form of Lease Stipulations or ROPs. The primary difference among alternatives is the level



of anticipated oil and gas development. Therefore, the potential for impacts to EFH is relative for each Alternative. The greatest potential for impacts exists under Alternative C, with increasingly less risk under Alternatives D, B, and A, respectively.

Through numerous Lease Stipulations and ROPs the various alternatives attempt to mitigate potential impacts to fish and their habitat. These are summarized in Table 2-2. Specific application of these stipulations and ROPs to protecting fish habitat is described in sections 4.3.7 (Alternative A), 4.4.7 (Alternative B), 4.5.7 (Alternative C), and 4.6.7 (Alternative D). Proper implementation of these protective measures should ensure that impacts to EFH are minimal.

### **EFH Finding**

Based on protective measures (stipulations and ROPs) and the low numbers of salmon utilizing the systems, oil and gas exploration and development in Northeast NPR-A is not expected to impact salmon or their habitat and is assigned the EFH determination: *May affect, not likely to adversely affect*.



## **Appendix D: Alternative A Stipulations**







## APPENDIX D

# ALTERNATIVE A STIPULATIONS

### Definitions

The following definitions apply to the following stipulations:

**Active Floodplain:** The lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum that area subject to a 1% or greater chance of flooding in any given year (also referred to as the 100-year or base floodplain).

**Body of Water or Waterbody:** A lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life.

**Permanent Oil and Gas Facilities:** Production facilities, pipelines, roads, airstrips, production pads, docks and other bottom-founded structures, seawater-treatment plants, and any other structures associated with an oil and gas operation that occupies land for more than one winter season. It does not include material sites or seasonal facilities such as ice roads and ice pads.

The following stipulations are based on existing policies and laws, and on knowledge of the resources present in the planning area and current industry practices. All stipulations will attach to all activities, including oil and gas leases issued in the planning area. All oil and gas activity permits issued subsequent to leasing shall comply with the appropriate lease stipulations specific to the activity under review. All permits issued in conjunction with other authorized activities (e.g., seismic operation, commercial guiding) within the planning area shall comply with the appropriate stipulations specific to the activity under review.

Additional site-specific stipulations may be added by the Authorized Officer (AO) as determined necessary by further NEPA analysis and as developed through consultation with other Federal, State, and NSB regulatory and resource agencies. Other Federal, State, and NSB permits (e.g., NPDES, Clean Water Act [CWA] Section 404) also may be required by law or regulation for an oil and gas project to proceed. A list of permits/approval commonly required by law or regulation for an oil and gas project is provided in Appendix B of this Supplement. Additional permits not listed in Appendix B may be required. Specific State permits are required where the state has primary authority, under Federal or State law or regulation, for enforcement of the provision in question. Specific permits issued by Federal agencies other than BLM could include permit conditions that are more stringent than those presented below.

**Exception Clause:** In the event that an exception to a lease or permit stipulation is requested, and before an exception may be granted, the Authorized Officer (AO) shall find that implementation of the stipulation is:



1.
  - a) technically not feasible, or
  - b) economically prohibitive, or
  - c) an environmentally preferable alternative is available, and
2. The alternative means proposed by the lessee fully satisfies the objective(s) of the stipulation.

In addition, prior to the consideration or granting of an exception to a lease or permit stipulation, all conditions and/or consultation requirements specific to a stipulation must be met. The AO shall consult with appropriate Federal, state, and North Slope Borough (NSB) regulatory and resource agencies before an exception may be granted, except in the case of an emergency. The AO's power to grant stipulation exceptions is limited to those subjects, uses, and permits over which the Bureau of Land Management (BLM) has authority. Exceptions may be granted in emergencies involving human health and safety.

### **Stipulations**

See pages II-4 through II-17 of the Final 1998 Northeast NPR-A IAP/EIS (Figures II.B.1 through II.B.14) for maps of the Land use Emphasis Areas (LUEAs) referred to in these stipulations.

### **Waste Prevention, Handling, and Disposal and Spills:**

1. To prevent and minimize present and future pollution, management decisions affecting waste generation shall be addressed in the following order of priority:
  - Prevention and Reduction
  - Recycling
  - Treatment
  - Disposal
- a. Lessees shall prepare a waste-management plan approved by the AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, to achieve specific waste-reduction and prevention goals for all phases of exploration and development (including activities conducted by contractors). The plan shall identify all waste streams that will be produced during each operation by type, volume, and toxicity and the method of disposal. For each waste stream, the lessee/operator shall describe what actions will be taken to minimize the volume. The plan should include activities that will integrate pollution prevention concepts into purchasing, inventory, shipping/receiving, operations maintenance, training, accounting, and design. The goal of the plan shall be continuous environmental improvement and achievement of reduction goals developed through the planning process. Lessees shall develop schedules for implementation and review to meet reduction and prevention goals, designate accountable personnel to carry out action items, and specify budget line items for plan elements. Lessees shall provide the AO with an annual waste-management report.
- b. Lessees shall implement a hazardous-materials tracking system to ensure proper use, storage, and management of materials being used within industrial processes. The use of chlorinated solvents is prohibited.
- c. Lessees shall conduct annual environmental compliance audits.



2. Attracting wildlife to food and garbage is prohibited. All feasible precautions shall be taken to avoid attracting wildlife to food and garbage. A current list of approved precautions, specific to type of permitted use, can be obtained from the AO. Lessees and permitted users shall have a written procedure to ensure that the handling and disposal of putrescible waste will be accomplished in a manner to prevent the attraction of wildlife.
3. Burial of garbage is prohibited. All putrescible waste shall be incinerated or composted through an AO-approved system, unless otherwise authorized by the AO. All solid waste, including incinerator ash, shall be removed from BLM lands and disposed of in an approved waste-disposal facility in accordance with U.S. Environmental Protection Agency (USEPA) and State of Alaska Department of Environmental Conservation (ADEC) regulations and procedures. Burial of human waste is prohibited except as authorized by the AO.
4. Except as specifically provided, all pumpable solid, liquid, and sludge waste shall be disposed of by injection in accordance with USEPA, ADEC, and the Alaska Oil and Gas Conservation Commission regulations and procedures. On-pad temporary muds and cuttings storage will be allowed as necessary to facilitate annular injection and/or backhaul operations.
5. Wastewater disposal:
  - a. Unless authorized by the National Pollution Discharge Elimination System (NPDES) or state permit, disposal of domestic wastewater into bodies of freshwater, including wetlands, is prohibited.
  - b. Surface discharge of reserve-pit fluids is prohibited unless authorized by applicable NPDES, ADEC, and NSB permits and approved by the AO.
  - c. Disposal of produced waters in upland areas, including wetlands, will be by subsurface-disposal techniques. The AO, in consultation with the ADEC and USEPA, may permit alternate disposal methods, if the lessee demonstrates that subsurface disposal is not feasible or prudent.
  - d. Discharge of produced waters into open or ice-covered marine waters less than 33 feet (10 meters) in depth is prohibited. The AO in consultation with ADEC and USEPA may approve discharges into waters greater than 33 feet (10 meters) in depth based on a case-by-case review of environmental factors and consistency with the conditions of a NPDES permit.
  - e. Alternate disposal methods will require an NPDES permit certified by the State.
6. Areas of operation shall be left clean of all debris.
7. All spills shall be cleaned up immediately and to the satisfaction of the AO and all agencies with regulatory authority over spills, including the USEPA, ADEC, and the U.S. Coast Guard.
8. Notice of any spill shall be given to the AO as soon as possible. Other Federal, state, and NSB entities shall be notified as required by law.



9. For oil and gas-related activities, a Hazardous Materials Emergency Contingency Plan shall be prepared and implemented prior to transportation, storage, or use of fuel. The plan shall include a set of procedures to ensure prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of a release. Procedures applicable to fuel handling (associated with transportation vehicles) may consist of Best Management Practices (BMPs) approved by the AO. The plan shall include a list of resources available for response (e.g., heavy-equipment operators, spill-cleanup materials or companies), and names and phone numbers of Federal, state, and NSB contacts. Other Federal and state regulations may apply and require additional planning requirements. All staff shall be instructed regarding these procedures.
10. Oil-spill-cleanup materials (absorbents, containment devices, etc.) shall be stored at all fueling points and vehicle-maintenance areas and be carried by field crews on all overland moves, seismic work trains, and similar overland moves by heavy equipment.
11. Lessees shall provide refresher spill-response training to NSB and local community spill-response teams on a yearly basis.
12. Lessees shall plan and conduct a major spill-response field-deployment drill annually.
13. Prior to production and as required by law, lessees shall develop spill prevention and response contingency plans and participate in development and maintenance of the *North Slope Subarea Contingency Plan for Oil and Hazardous Substances Discharges/Releases* for the National Petroleum Reserve – Alaska operating area. Planning shall include development and funding of detailed (e.g., 1:26,000 scale) environmental sensitivity index maps for the lessee's operating area and areas outside the lessee's operating area that could be affected by their activities. (The specific area to be mapped shall be defined in the lease agreement and approved by the AO in consultation with appropriate resource agencies.) Maps shall be completed in paper copy and geographic information system format in conformance with the latest version of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's *Environmental Sensitivity Index Guidelines*. Draft and final products shall be peer reviewed and approved by the AO in consultation with appropriate Federal, state, and NSB resource and regulatory agencies.
14. Except during overland moves and seismic operations (see Stipulation 24[m]), fuel, other petroleum products, and other liquid chemicals designated by the AO, whether in excess of 660 gallons in a single tank or in excess of 1,320 gallons in multiple containers, shall be stored within an impermeable lined and diked area capable of containing 110% of the stored volume. The liner material shall be compatible with the stored product and capable of remaining impermeable during typical weather extremes expected throughout the storage period. Permanent fueling stations shall be lined or have impermeable protection to prevent fuel migration to the environment due to overfills and spills. The storage area shall be located at least 500 feet from any waterbody with the exception of small caches (up to 210 gallons) for motor boats, float planes, and ski planes.
15. Fuels shall not be stored on the active floodplain of any waterbody. Although fuels may be off-loaded from aircraft on ice, fuels shall not be stored on lake or river ice.



16. Refueling of equipment within 500 feet of the highest high water mark of any waterbody is prohibited with the exception of refueling motor boats, float planes, and ski planes. See Stipulation 24[n] for restrictions related to overland moves and seismic operations.
17. All fuel containers, including barrels and propane tanks, shall be marked with the responsible party's name, product type, and year filled or purchased.

#### **Ice Roads and Water Use:**

18. The location of winter ice roads shall be offset from year to year to minimize vegetative impacts. The offset shall be greater than or equal to the width of the road.
19. Compaction of snow cover or snow removal from fish-bearing waterbodies shall be prohibited except at approved ice-road crossings.
20. Water withdrawal from rivers and streams during winter is prohibited. Water withdrawal is prohibited during winter from lakes less than 7 feet (2.1 meters) deep if they are interconnected with or subject to seasonal flooding by a fish-bearing stream. Water may be withdrawn from isolated lakes that are less than 7 feet (2.1 meters) deep that lack connection to or are not subject to seasonal flooding by a fish-bearing stream. After consultation with the appropriate Federal, state, and NSB regulatory and resource agencies, the AO may authorize withdrawals from any lake less than 7 feet (2.1 meters) deep, if the proponent demonstrates that no fish exist in the lake.

Generally, water withdrawal drawdown during winter from lakes 7 feet (2.1 meters) deep or deeper shall be limited to 15% of the estimated free-water volume (i.e., excluding the ice). After consultation with the appropriate Federal, state, and NSB regulatory and resource agencies, the AO may authorize drawdown exceeding 15% from a lake greater than 7 feet (2.1 meters) deep, if the proponent of the additional drawdown demonstrates that no fish exist in the lake. Operators are encouraged to use new ice-road and ice-pad construction methods, such as using aggregate "chips" shaved from frozen lakes, to decrease water demands, construction time, and impact on fisheries.

21. The AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, may allow water extraction from any lake used by molting geese, if it is determined that the withdrawal is consistent with Stipulation 20 and will not adversely affect identified goose-feeding habitat along lakeshore margins. An analysis/demonstration of the hydrologic functions of the lake(s) under review may be required of the lessee by the AO prior to approval of the withdrawal.
22. Except for approved crossings, alteration of the banks of a waterway is prohibited. Waterways include natural features with sufficient water to create riparian (willow) habitat such as rivers, streams, deep and shallow lakes, tundra ponds, and shallow water tracks. Clearing of willows along the riparian zone is prohibited. Movement of equipment through willow stands shall be avoided whenever possible.



### Overland Moves and Seismic Work:

23. Seismic work is prohibited within 1,200 feet of any known, long-term cabin or campsite, identified by the AO, without the written permission of the AO. The AO's decision will be informed by the consultation process described in Stipulation 61.
24. The following restrictions apply to overland moves, seismic work, and any similar use of heavy equipment (other than actual excavations as part of construction) on unroaded surfaces during the winter season:
  - a. Because polar bears are known to den predominantly within 25 miles of the coast, operators shall consult with the U.S. Fish and Wildlife Service (USFWS) prior to initiating activities in such habitat between October 30 and April 15. Activities are prohibited within 1 mile of known or observed polar bear dens; obtain locations from the USFWS, (907) 786-3800. Operators are encouraged to apply for a letter of authorization from the USFWS to conduct activities in polar bear denning areas.
  - b. Motorized ground-vehicle use will be minimized within the Colville River Raptor, Passerine, and Moose Area LUEA from April 15 through August 5, with the exception that use will be minimized in the vicinity of gyrfalcon nests beginning March 15. Such use will remain ½ mile away from known raptor-nesting sites, unless authorized by the AO. The BLM shall consult with the USFWS to plan travel routes to minimize disturbance to raptors.
  - c. Crossing of waterway courses shall be made using a low-angle approach to avoid disruption of the natural stream or lake bank. Except at approved crossings, operators are encouraged to travel a minimum of 100 feet from overwintering fish streams and lakes.
  - d. If snow ramps or snow bridges are used at water crossings for bank protection, the ramps and bridges shall be substantially free of soil and/or debris. Snow bridges shall be removed or breached immediately after use or before spring breakup.
  - e. To avoid additional freeze down of deep-water pools harboring overwintering fish, waterways shall be crossed at shallow riffles from point bar to point bar whenever possible.
  - f. On-the-ground activities shall use low-ground-pressure vehicles such as Rolligons, ARDCO, Trackmaster, Nodwell, or similar types of vehicles. A current list of approved vehicles can be obtained from the AO. Limited use of tractors equipped with wide tracks or "shoes" will be allowed to pull trailers.
  - g. Bulldozing of tundra, trails, or seismic lines is prohibited. This stipulation, however, does not prohibit the clearing of drifted snow along a trail, seismic line, or in a camp, to the extent that the tundra mat is not disturbed. Snow may be cleared from a waterbody ice surface to prepare an aircraft runway, if approved by the AO in consultation with appropriate Federal, state, and NSB regulatory and resource agencies.



- h. To reduce the possibility of ruts, vehicles shall avoid using the same trails for multiple trips unless necessitated by serious safety or superseding environmental concern. This provision does not apply to ice roads (see Stipulation 18 above).
- i. Ground operations are to begin only after the seasonal frost in the tundra and underlying mineral soils has reached a depth of 12 inches, and the average snow cover is 6 inches deep. The exact date shall be determined by the AO.
- j. Ground operations shall cease when the spring melt of snow begins; approximately May 5 in the foothills area where elevations exceed 300 feet, and approximately May 15 in the northern coastal areas. The exact date will be determined by the AO.
- k. Seismic activities and overland moves within the Goose Molting Land Use Emphasis Area (LUEA) and the Teshekpuk Lake Caribou Habitat LUEA from May 1 through September 30 are prohibited. (Note that this overrides language in Stipulation 24[j].)
- l. To prevent surface disturbance to tundra and other vegetation, tracked vehicles will not execute tight turns by locking one track.
- m. Operators shall use best available technology (e.g., self-contained containment systems) or other appropriate spill containment measures, approved by the AO, to prevent fuel migration from fuel or chemical storage areas to the environment due to overfills and spills.
- n. Refueling of equipment is prohibited within the active floodplain of any waterbody.

#### **Oil and Gas Exploratory Drilling:**

- 25. From May 1 through September 30, exploratory drilling other than from production pads is prohibited in the Special Caribou Stipulations Area.
- 26. Exploratory drilling is prohibited within 1,200 feet of any known, long-term cabin or campsite, identified by the AO, without written permission of the AO. The AO's decision will be informed by the consultation process described in Stipulation 61.
- 27. Permanent or gravel oil and gas facilities including roads shall not be constructed during the exploration phase of oil and gas development.
- 28. Exploratory drilling in river, stream, and lake beds, as determined by the highest high water mark, is prohibited. Exceptions to this stipulation may be authorized by the AO in cases of shallow lakes which freeze to the bottom, do not support significant fish or bird populations, and are hydrologically isolated. Further, such an exception may be granted only if it is environmentally preferable to maintaining the restriction.



## Facility Design and Construction:

29. At least 3 years prior to approval of any development plan for leases within the Special Caribou Stipulations Area, the lessee shall design and implement a study of caribou movement, including historical information regarding the distribution and range use of the Teshekpuk Lake Caribou Herd, as well as maps of caribou trails within the area. Study data may be gathered concurrent with approved seismic and exploration activity. The study design shall be approved by the AO in consultation with the Research and Monitoring Team. The study will include a minimum of 3 years of data to assist in providing the information necessary to determine facility design and location, including pipelines, which will be part of the development plan. Lessees may submit individual plans or they may combine with other lessees in the area to do a joint study. Total study funding by all lessees will not exceed \$500,000.
30. Causeways and docks are prohibited in river mouths or deltas. Artificial gravel islands and bottom-founded structures are prohibited in river mouths or active stream channels on river deltas, except as provided in the paragraphs below.

The BLM discourages the use of continuous-fill causeways. Environmentally preferred alternatives for field development include the use of onshore directional drilling, elevated structures, or buried pipelines. Approved causeways shall be designed, sited, and constructed to prevent significant changes to near shore oceanographic circulation patterns and water-quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedences of water-quality criteria, and must maintain free passage of marine and anadromous fish.

Causeways, docks, artificial gravel islands, and bottom-founded structures may be permitted if the AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, determines that a causeway or other structure is necessary for field development, and that no feasible and prudent alternative exists. A monitoring program may be required to address the objectives of water quality and free passage of fish. Additional mitigation shall be required where significant deviation from these objectives occurs.

31. Permanent oil and gas surface occupancy, including but not limited to permanent oil and gas facilities, pads, rigs, platforms, gravel roads, airstrips, pipelines, gravel or other material extraction sites, and exploration and delineation drilling facilities are prohibited in the Teshekpuk Lake Surface Protection Area (specifically, T. 13 N., Rs. 3-7 W., U.M.; Secs. 1-6, 8-16, 21-25, 36, T. 13 N., R. 8 W., U.M.; T. 14 N., Rs. 1-2 E. and Rs. 1-8 W., U.M.; Secs. 1-2, 11-14, T. 14 N., R. 9 W., U.M.; T. 15 N., Rs. 2-8 W., U.M.; Secs. 1-3, 7-30, 35-36, T. 15 N., R. 9 W., U.M.; T. 16 N., Rs. 2-8 W., U.M.; Secs. 1-6, 8-17, 21-27, 34-36, T. 16 N., R. 9 W., U.M.; T. 17 N., Rs. 1-9 W., U.M.; and T. 18 N., Rs. 2-8 W., U.M.). No exceptions will be granted to this stipulation.
32. Lessees shall use maximum economically feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads. New developments shall share facilities with existing development when prudent and technically feasible. All oil and gas facilities, except airstrips, docks, and seawater-treatment plants, will be collocated with drill pads. If possible, airstrips will be integrated with roads. Given the paucity of gravel sites in the Planning Area and the



cost of transporting gravel from outside the Planning Area, lessees are encouraged to implement gravel-reduction technologies e.g., insulated or pile-supported pads.

33. Within the Special Caribou Stipulations Area, lessees shall orient linear corridors when laying out oil field developments to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities.
34. Lessees shall separate elevated pipelines from roads by a minimum of 500 feet, if feasible. Separating roads from pipelines may not be feasible within narrow land corridors between lakes and where pipe and road converge on a drill pad.
35. To minimize delay or deflection of caribou movements, lessees shall place pipeline on the appropriate side of the road as determined by the AO (depending on general caribou movements in the area).
36. In the Special Caribou Stipulations Area and where facilities or terrain may funnel caribou movement, ramps over pipelines, buried pipe, or pipe buried under the road may be required by the AO after consultation with appropriate Federal, state, and NSB regulatory and resource agencies.
37. Aboveground pipelines shall be elevated at least 5 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a road, pad, or a ramp installed to facilitate wildlife passage and subsistence passage and access. The AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, may make an exception if no feasible and prudent means exists to meet the requirement.
38. All crude oil, produced water, seawater, and natural gas pipelines shall be constructed to accommodate the best available technology for detecting corrosion or mechanical defects during routine structural integrity inspections.
39. Permanent oil and gas facilities, including roads, airstrips, and pipelines, are prohibited within and adjacent to the waterbodies listed below at the distances identified to protect fish and raptor habitat, cultural and paleontological resources, and subsistence and other resource values. Setbacks include the bed of the waterbody and are measured from the bank's highest high water mark.
  - a. **Ikpikpuk River:** a ½-mile setback from the bank of the Ikpihpuk River within the Planning Area (fish, raptors, subsistence, cultural, and paleontological resources).
  - b. **Miguakiak River:** a ½-mile setback from each bank of the Miguakiak River (fish and subsistence resources).
  - c. **Teshkepuk Lake:** a ½-mile setback from the bank and around the perimeter of Teshkepuk Lake (fish and subsistence resources).
  - d. **Fish Creek:** 1) a 3-mile setback from each bank of Fish Creek downstream from Sec. 31, T. 11 N., R. 1 E.; 2) a ½-mile setback from each bank of Fish Creek in and upstream from Sec. 31, T. 11 N., R. 1 E., U.M. (fish and subsistence resources).



- e. **Judy Creek:** a ½-mile setback from each bank of Judy Creek extending from the mouth to the confluence of an unnamed tributary in Sec. 8, T. 8 N., R. 2 W., U.M. (fish and subsistence resources).
- f. **Colville River:** a 1-mile setback from the western bluff (or bank if there is no bluff) of the Colville River extending the length of the river as described in the Colville River Raptor, Passerine, and Moose LUEA. This restriction does not apply within 1½ mile of the Umiat airstrip (fish, raptor, passerine, moose, paleontological, subsistence, scenic, and recreational resources).
- g. **Deep Water Lakes:** a ¼-mile setback around the perimeter of any fish-bearing lake within or partially within the deep lake zone (fish resources). If the fish-bearing status of the waterbody is unknown, the burden is on the lessee to demonstrate whether fish are present.
- h. **Kikiakrorak River:** a 1-mile setback from each bluff (or bank if there is no bluff) of the Kikiakrorak River downstream from T. 2 N., R. 4 W., U.M. (raptor, passerine, and moose resources).
- i. **Kogosukruk River:** a 1-mile setback from each bluff (or bank if there is no bluff) of the Kogosukruk River (including the four tributaries off the southern bank) downstream from T. 2 N., R. 3 W., U.M. (raptor, passerine, and moose resources).

On a case-by-case basis, essential pipeline and road crossings will be permitted, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, through setback areas in those instances where no other suitable sites are available. Stream crossings will be sited perpendicular to the main channel flow; lake crossings will be at the narrowest point. Pipeline and road crossings are prohibited in the setback around Teshekpuk Lake, with no exceptions. Road crossings are prohibited in the setback adjacent to the Colville River with no exceptions.

- 40. Gravel mining sites required for development activities will be restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage. Where feasible and prudent, gravel sites shall be designed and constructed to function as water reservoirs for future use. Gravel mine sites are prohibited within the active floodplain of a river, stream, or lake unless the AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, determines that there is no feasible and prudent alternative or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed and the site is closed.

Mine site development and rehabilitation within a floodplain shall follow the procedures outlined in McLean (1993), *North Slope Gravel Pit Performance Guidelines*, Alaska Department of Fish and Game (ADFG), Habitat and Restoration Division, Technical Report 93-9.

- 41. For those waterbodies not listed in Stipulation 39, permanent oil and gas facilities, including roads, airstrips, and pipelines, are prohibited upon or within 500 feet as measured from the highest high water mark of the active floodplain. Essential pipeline and road crossings will be permitted on a case-by-case basis.



42. Bridges, rather than culverts, shall be used for any allowed road crossings on all major rivers, including those waterbodies listed in Stipulation 39 or identified by the AO in consultation with appropriate Federal, state, and NSB regulatory and resource agencies, to reduce the potential of ice-jam flooding and erosion. When necessary on smaller streams, culverts shall be large enough to avoid restriction of fish passage or adversely affecting natural stream flow.
43. The natural drainage pattern will be identified prior to and maintained during and after construction. All permanent structures constructed adjacent to a body of water, such as approved road and pipeline crossings, shall be sited and designed to limit erosion from flooding and wave action (e.g., through use of slope-protection measures). Cross-drainage structures will be sited, maintained, and properly abandoned to prevent impoundments or alteration of local or areawide hydrology. Gravel structures shall be designed and sited to minimize the length that is perpendicular to sheet flow.
44. Dewatering during construction shall be conducted using BMPs. A current list of BMPs will be available from the AO. Examples include the use of splash plates, dewatering points, natural filtration through vegetation, and dewatering during low-water period.
45. No surface structures, except essential transportation crossings, are allowed within the Pik Dunes LUEA.
46. Lessees shall minimize the impact of industrial development on key wetlands. Key wetlands are those wetlands that are important to fish, waterfowl, and shorebirds because of their high value or scarcity in the region. Lessees shall identify on a map or aerial photograph the largest surface area, including future expansion areas, within which a facility is to be sited or an activity is to occur. The AO will consult with Federal, state, and NSB regulatory and resource agencies to identify key wetlands and work with lessees during the development of operating plans. To minimize impact, the lessee shall avoid siting facilities in the identified wetlands, unless no feasible and prudent alternative exists. Key wetland types include but are not limited to fish-bearing lakes and streams, riparian shrub, and the following classes described by Bergman et al. (1977): shallow and deep-*Arctophila* ponds, deep-open lakes, basin-complex wetlands, and coastal wetlands.
47. Permanent oil and gas facilities are prohibited within 1 mile of known long-term cabins or long-term campsites, identified by the AO, except that pipelines and roads are allowed up to ¼ mile from such cabins or campsites. The AO's decision will be informed by the consultation process described in Stipulation 61.
48. Permanent roads (i.e., gravel, sand) connecting to a road system or docks outside the Planning Area are prohibited, and no exceptions may be granted. Permanent roads necessary to connect pads within independent, remote oil fields are allowed but they must be designed and constructed to create minimal environmental impacts. Roads connecting production sites between separate oil fields may be considered if road-connected operations are environmentally preferable to independent, consolidated operations that each include airstrip, housing, production, and support facilities. This exception will only be granted following consultations with appropriate Federal, state, and NSB regulatory and resources agencies, and the appropriate level of National Environment Policy Act (NEPA) review.



### **Ground Transportation:**

49. The following ground-traffic restrictions apply to permanent roads (as authorized in Stipulation 48 above) in the Special Caribou Stipulations Area:
- a. From May 20 through June 20:
    - (1) Traffic speed will not exceed 15 miles per hour.
    - (2) Traffic will be minimized (a reasonable target would be four convoy round-trips per day between facilities). Nonessential operations requiring vehicles shall be suspended during this time period.
  - b. From May 20 through August 1:
    - (1) Caribou movement will be monitored.
    - (2) Based on this monitoring, traffic will cease when a crossing by 10 or more caribou appears to be imminent.
  - c. From May 20 through August 20:
    - (1) Convoying will be used to minimize the number of disturbances due to road traffic.
    - (2) Personnel will be bussed between work sites and other facilities to minimize the number of vehicles on the road.
50. Major stockpiling of equipment, materials, and supplies for oil and gas activities in the Special Caribou Stipulations Area shall occur prior to or after the period May 20 through June 20 to minimize road traffic during that period.
51. Chasing wildlife with ground vehicles is prohibited.

### **Air Traffic:**

(Note: The BLM's authority to restrict air traffic is limited to those activities associated with use authorization on BLM-administered lands.)

52. Use of aircraft larger than a Twin Otter for authorized activities in the Planning Area, including oil and gas activities, from May 20 through August 20 within the Teshekpuk Lake Caribou LUEA is prohibited, except in cases of emergency.
53. Helicopter overflights for BLM-permitted activities shall be suspended in the Goose Molting LUEA from June 15 through August 20.
54. Fixed-wing aircraft traffic takeoffs and landing for BLM-permitted activities in the Planning Area shall be limited to an average of one round-trip flight a day from May 20 through June 20 at aircraft facilities in the Teshekpuk Lake Caribou Habitat LUEA. Within the Goose Molting LUEA, fixed-wing aircraft use for such activities shall be restricted from June 15 to August 20 to flight corridors and frequencies established by BLM in consultation with the appropriate Federal, state, and NSB regulatory and resource agencies.



55. Aircraft shall maintain an altitude of at least 1,000 feet above ground level (AGL) (except for takeoffs and landings) over caribou winter ranges from October 1 through May 15 and 2,000 feet AGL over the Teshekpuk Lake Caribou Habitat LUEA from May 16 through July 31, unless doing so would endanger human life or violate safe flying practices.
56. Aircraft shall maintain an altitude of at least 1,500 feet AGL when within ½ mile of cliffs identified as raptor nesting sites from April 15 through August 5, unless doing so would endanger human life or violate safe flying practices. Aircraft shall maintain an altitude of 1,500 feet AGL when within ½ mile of known gyrfalcon nest sites from March 15 to April 15. Permittees shall obtain information from the BLM necessary to plan flight routes near gyrfalcon nests.
57. Hazing of wildlife by aircraft is prohibited.

#### **Oil Field Abandonment:**

58. Upon field abandonment or expiration of a lease or oil and gas-related permit, all facilities shall be removed and sites rehabilitated to the satisfaction of the AO, in consultation with appropriate Federal, state, and NSB regulatory and resource agencies. The AO may determine that it is in the best interest of the public to retain some or all of the facilities. Lessees shall comply with all exploration and development bonding required by law and regulation (43 CFR § 3154.1 and 3134.1). No exceptions shall be granted to this provision.

#### **Subsistence:**

59. During exploration, development, and production, the lessee shall develop and implement a plan, approved by the AO in consultation with the Research and Monitoring Team and the Subsistence Advisory Panel, to monitor the effects of activities on subsistence. The lessee shall provide biannual reports to the BLM, the Research and Monitoring Team, and the Subsistence Advisory Panel.
60. Lessees shall not unreasonably restrict access by subsistence users in oil field development areas.
  - a. Lessees shall establish procedures for entrance to facilities, the use of roads, and firearms discharge. These procedures shall be developed in consultation with affected local communities, NSB, and the Subsistence Advisory Panel and be approved by the AO. In cases where the lessee and the Panel disagree, the AO will determine the appropriate procedure.
  - b. Lessees shall develop and distribute information about how to conduct subsistence activities in development areas safely (so equipment is not damaged and people are not endangered) to the communities through public meetings, newsletters, radio, and signs in both English and Iñupiaq.
61. Exploration and development and production operations shall be conducted in a manner that prevents unreasonable conflicts between the oil and gas industry and subsistence activities.



Prior to submitting an exploration plan or development and production plan (including associated oil-spill contingency plans) to the BLM, the lessee shall consult with potentially affected subsistence communities (e.g., Barrow, Nuiqsut, Atqasuk, or Anaktuvuk Pass), NSB, and the Subsistence Advisory Panel to discuss potential conflicts with the siting, timing, and methods of proposed operations and safeguards or mitigating measures that could be implemented by the operator to prevent unreasonable conflicts. Through this consultation, the lessee shall make every reasonable effort, including such mechanisms as a conflict avoidance agreement, to ensure that exploration, development, and production activities are compatible with subsistence hunting, fishing, and other subsistence activities and will not result in unreasonable interference with subsistence harvests.

A discussion of resolutions reached during this consultation process, specific conflict avoidance agreement(s), and plans for continued consultation shall be included in the permit application, exploration plan, or the development and production plan. In particular, the lessee shall show in the plan how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence activities. Lessees also shall include a discussion of multiple or simultaneous operations, such as exploration and delineation well drilling and seismic activities, that can be expected to occur during operations to more accurately assess the potential for any cumulative effects. Communities, individuals, and other entities who were involved in the consultation shall be identified in the application or plan. The AO shall send a copy of the exploration plan or development and production plan (including associated oil-spill-contingency plans) to the potentially affected communities, the NSB, and the Subsistence Advisory Panel at the time they are submitted to the BLM to allow concurrent review and comment as part of the plan approval process.

In the event no agreement is reached between the parties, the AO shall consult with representatives from the subsistence communities, Subsistence Advisory Panel, NSB, and the lessee(s) to specifically address the conflict and attempt to resolve the issues before making a final determination on the adequacy of the measures taken to prevent unreasonable conflicts with subsistence harvests.

The lessee shall notify the AO of all concerns expressed by subsistence users during operations and of steps taken to address such concerns. Lease-related use will be restricted, when the AO determines it is necessary to prevent unreasonable conflicts with local subsistence hunting, fishing, and other subsistence activities.

In enforcing this stipulation, the AO will work with other agencies and the public to assure that potential conflicts are identified and efforts are taken to avoid these conflicts, e.g., planning seismic operations to avoid traditional land use sites and allotments. These efforts may include seasonal drilling restrictions, seismic restrictions, and directional drilling requirements or use of other technologies deemed appropriate by the AO.

The consultation process described in this stipulation will also be required of applicants for geophysical (i.e., seismic) permits to address potential conflicts with the setback requirements for cabins and campsites described in Stipulation 23. This consultation will help provide information to the AO on the advisability of modifying or waiving the restriction on seismic activity identified in Stipulation 23.



62. The following subsistence, wildlife habitat, and traditional/cultural land use areas are of significant concern to local communities and will be given special consideration during the consultation process outlined in Stipulation 61:
- a. **Long-term cabins and campsites:** a 2-mile zone around the cabins and campsites.
  - b. **Ikpikpuk River:** a 2-mile zone from the east bank of the river.
  - c. **Miguakiak River:** a 3-mile zone from each bank of the river.
  - d. **Fish Creek:** 1) a 3-mile zone from each bank downstream from Sec. 31, T. 11 N., R. 1 E., U.M.; 2) a 2-mile zone from each bank in and upstream from Sec. 31, T. 11 N., R. 1 E., U.M.
  - e. **Judy Creek:** a 2-mile zone from each bank of the creek.
  - f. **Kogosukruk River:** a 2-mile zone from each bluff (or bank if there is no bluff) of the river (including the four tributaries off the southern bank) downstream from T. 2 N., R. 3 W., U.M.
  - g. **Kikiakrorak River:** a 2-mile zone from each bluff (or bank if there is no bluff) of the river downstream from T. 2 N., R. 4 W., U.M.
  - h. **Colville River:** a 2-mile zone from the west bluff (or bank if there is no bluff) extending the length of river in the Colville River Raptor, Passerine, and Moose LUEA.

In addition, a permittee or lessee engaged in oil and gas-related activity shall consult with the BLM, USFWS, ADFG, and the NSB regarding wildlife concerns prior to submitting a geophysical (i.e., seismic) permit, exploration plan, or development and production plan involving activity within the 2-mile zones around the Kogosukruk (and its tributaries), Kikiakrorak, and Colville rivers described above. In the event that the permittee or lessee and the agencies are unable to reach agreement on steps necessary to address wildlife concerns, the AO will consult with the other agencies and the permittee or lessee before making a determination on the adequacy of the measures taken to prevent conflicts with wildlife.

#### **Orientation Program:**

63. The lessee shall include in any application for permit to drill a proposed orientation program for all personnel involved in exploration or development and production activities (including personnel of lessee's agents, contractors, and subcontractors) for review and approval by the AO. The program shall be designed in sufficient detail to inform individuals working on the project of specific types of environmental, social, and cultural concerns that relate to the Planning Area. The program shall address the importance of not disturbing archaeological and biological resources and habitats, including endangered species, fisheries, bird colonies, and marine mammals and provide guidance on how to avoid disturbance. Guidance shall include the production and distribution of information cards on endangered and/or threatened species in the



Planning Area. The program shall be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which personnel will be operating. The orientation program shall also include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation.

The program shall be attended at least once a year by all personnel involved in on-site exploration or development and production activities (including personnel of lessee's agents, contractors, and subcontractors) and all supervisory and managerial personnel involved in lease activities of the lessee and its agents, contractors, and subcontractors. Individual training is transferable from one facility to another except for elements of the training specific to a particular site.

Lessees shall maintain a record onsite of all personnel who attend the program for so long as the site is active, though not to exceed the five most recent years of operations. This record shall include the name and dates(s) of attendance of each attendee.

#### **Traditional Land Use Sites:**

64. Lessees shall conduct an inventory of known traditional land use sites prior to any field activity. This inventory will be compiled from sites listed in the most current Traditional Land Use Inventory available from the NSB's Iñupiat History, Language, and Cultural Commission, and shall be approved by the AO. Based on this inventory, the lessee shall develop a plan to avoid these sites and mitigate any potential damage that could result from field activities. The plan shall indicate how access to the site by local subsistence users will be provided. Lessees shall submit copies of the plan to BLM and the Subsistence Advisory Panel with any application for permit to drill.

#### **Other Activities:**

65. It is the responsibility of the authorized user to ensure that all individuals brought to the Planning Area under its auspices adhere to these stipulations. Authorized users of the Planning Area shall provide all employees, contractors, subcontractors, and clients with a briefing regarding stipulations applicable to the lease and/or permit. A copy of applicable stipulations will be posted in a conspicuous place in each work site and campsite.
66. The authorized user shall protect all survey monuments and be responsible for survey costs if remonumentation is required as a result of the user's actions.
67. All activities shall be conducted to avoid or minimize disturbance to vegetation.
68. The BLM, through the AO, reserves the right to impose closure of any area to operators in periods when fire danger or other dangers to natural resources are severe.
69. The authorized user shall be financially responsible for any damage done by a wildfire caused by its operations.
70. Construction camps are prohibited on frozen lakes and river ice. Siting of construction camps on river sand and gravel bars is allowed and, where feasible, encouraged. Where



leveling of trailers or modules is required and the surface has a vegetative mat, leveling shall be accomplished through blocking rather than use of a bulldozer.

71. Use of pesticides without the specific authority of the AO is prohibited.
72. The feeding of wildlife by authorized users is prohibited.
73. Hunting and trapping by lessee's employees, agents, and contractors are prohibited when persons are on "work status." Work status is defined as the period during which an individual is under the control and supervision of an employer. Work status is terminated when the individual's shift ends and he/she returns to a public airport (e.g., Fairbanks, Barrow, Nuiqsut, or Deadhorse). Use of lessee facilities, equipment, or transport for personnel access or aid in hunting and trapping is prohibited.
74. Lessees shall conduct a cultural and paleontological resources survey prior to any ground-disturbing activity. Upon finding any potential cultural or paleontological resource, the lessee or their designated representative shall notify the AO and suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the AO.
75. Petroleum exploration and production activities are prohibited within ½ mile of occupied grizzly bear dens, identified by the ADFG, unless alternative mitigation measures are approved by the AO in consultation with appropriate Federal, state, and NSB regulatory and resource agencies.
76. Oil and gas lessees and their contractors and subcontractors will prepare and implement bear-interaction plans to minimize conflicts between bears and humans. These plans shall include measures to: (a) minimize attraction of bears to the drill sites; (b) organize layout of buildings and work areas to minimize human/bear interactions; (c) warn personnel of bears near or on drill sites and identify proper procedures to be followed; (d) if authorized, deter bears from the drill site; (e) provide contingencies in the event bears do not leave the site or cannot be deterred by authorized personnel; (f) discuss proper storage and disposal of materials that may be toxic to bears; and (g) provide a systematic record of bears on the site and in the immediate area. The lessees shall develop educational programs and camp layout and management plans as they prepare their lease operations plans. These plans shall be developed in consultation with appropriate Federal, state, and NSB regulatory and resource agencies and submitted to the AO.
77. Operators are encouraged to apply for a letter of authorization from the USFWS to conduct activities in polar bear denning areas.
78. Permanent structures, other than oil and gas facilities, are prohibited within 100 feet of the highest high water mark of the nearest body of water.
79. Lessees shall use smokeless flares for handling routine conditions and use auxiliary smokeless flares for planned events that exceed the capacity of routine flares. Lessees shall use flares that meet the Federal New Source Performance design standards listed in 40 CFR § 60.18.







## **Appendix E: Alternatives B and C Stipulations and Required Operating Procedures**







## APPENDIX E

# ALTERNATIVES B AND C STIPULATIONS AND REQUIRED OPERATING PROCEDURES

Definitions .....	E-3
Applicability of Requirements/Standards .....	E-4
Stipulations and Required Operating Procedures .....	E-5
Waste Prevention, Handling, Disposal, Spills and Public Safety .....	E-5
Water Use for Permitted Activities .....	E-7
Winter Overland Moves and Seismic Work .....	E-8
Oil and Gas Exploratory Drilling .....	E-10
Facility Design and Construction .....	E-10
Use of Aircraft for Permitted Activities .....	E-13
Oil Field Abandonment .....	E-14
Subsistence Consultation for Permitted Activities .....	E-14
Orientation Programs Associated with Permitted Activities .....	E-15
Endangered Species Act—Section 7 Consultation Process .....	E-16
Lease Stipulations that Apply in Biologically Sensitive Areas .....	E-16
Summer Vehicle Tundra Access .....	E-22







## Definitions

The following definitions in the context of this document, apply to general lease stipulations and site-specific stipulations (K-Stipulations) and Required Operating Procedures (ROPs):

**Active Floodplain:** The lowland and relatively flat areas adjoining inland and coastal waters, including the flood-prone areas of offshore islands, composing, at a minimum, that area subject to a 1% or greater chance of flooding in any given year (also referred to as the 100-year or base floodplain).

**Authorized Officer (AO):** A position of authority for approval of various activities through delegation from the Secretary of the Interior. Currently, the designated AOs in the State of Alaska for leasing, surface use, and permitting are 1) State Director, 2) Manager of the Fairbanks District Office in Fairbanks, and 3) Deputy State Director of the Division of Energy and Solid Minerals.

**Body of Water or Waterbody:** A lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life.

**Consultation:** Consultation, as it is referenced in the stipulations, does not infer formal consultation as required under other legal mandates such as “Section 7 Consultation” under the ESA. Rather, consultation implies that the BLM or the Lessee/Permittee will contact other agencies or entities to either inform them of potential actions and/or to seek input on noted topics. This includes informal contacts, and written, electronic, and/or verbal communication.

**General Lease Stipulation:** Mitigation developed through BLM planning process/NEPA process that is specifically attached to any lease issued in the Northeast Planning Area.

**Restricted Surface Occupancy:** No permanent oil and gas facilities, except pipelines and in some cases roads, will be allowed.

**Permanent Oil and Gas Facilities:** Production facilities, pipelines, roads, airstrips, production pads, docks and other bottom-founded structures, seawater-treatment plants, and other structures associated with an oil and gas operation that occupy land for more than one winter season. Material sites, exploration wellheads, and seasonal facilities such as ice roads and ice pads are excluded, even when the pads are designed for use in successive winters.

**Required Operating Procedure:** Mitigation developed through the BLM planning process/NEPA process that is not attached to the oil and gas lease but is required, implemented and enforced at the operational level for all authorized (not just oil and gas) activities.

*Compliance with Required Operating Procedures:* Required Operating Procedures were developed with various mechanisms in place to ensure compliance. These mechanisms include the following:

- 1) Some ROPs are pre-application requirements; therefore compliance will precede approval of the proposed activity. For example, ROP H-1 (a) requires consultation with affected communities prior to submission of an application for relevant activities within the Northeast Planning Area. If consultation has not taken place, the application will be rejected or will be considered incomplete until such time that the consultation has occurred.



- 2) Other ROPs are required design features, and would have to be incorporated into the applicant's proposal. As an integral part of the proposal and the authorization, the requirement does not need to be stipulated to be enforceable. For example, a minimum pipeline height of 7 feet for above ground pipelines is a required design of any approved above ground pipeline (ROP E-7). Since the authorization (a ROW in this case) authorizes a pipeline with a minimum height of 7 feet, anything less (unless specifically approved through additional NEPA analysis and the permit) is not in compliance and enforcement actions may be taken even if the permit does not specify a minimum of 7 feet.
- 3) Other ROPs will become conditions of approval on post oil and gas lease land use authorizations and they would be enforceable. For example ROP C-1 prohibits heavy equipment used for cross-country moves within ½ mile of occupied grizzly bear dens.

**Site Specific Lease Stipulation (K-Stipulations):** A mitigation measure developed through the BLM planning process/NEPA process attached only to leases issued within spatially defined areas in the Northeast Planning Area (see maps 2-2, 2-3, and 2-4).

### **Applicability of Requirements/Standards**

All surface disturbing activities such as exploratory drilling, road/pipeline construction, seismic acquisition, and overland moves require additional authorization(s) issued subsequent to leasing. The stipulations and ROPs require that certain protections of resources and uses be achieved. Requirements and standards listed with the stipulations and ROPs represent BLM's current understanding of how lessees/permittees would achieve the objectives of the stipulation or ROP.

A lessee/permittee may propose a deviation from the requirements/standards of stipulations and ROPs as part of an authorization application. Prior to approving an alternative procedure as part of the authorization, BLM's staff would analyze the proposal and determine if the proposal incorporating the alternative procedure would achieve the objectives of the stipulations and ROPs. If the BLM determines that the alternative procedure proposed by the applicant would meet the stipulation's or ROP's objective, BLM could approve the alternative procedure.

If BLM determines that the alternative procedure proposed by the applicant is unlikely to meet the objectives of a stipulation or ROP, the AO may allow a deviation from the objectives and requirement/standard in a new decision document supported by additional NEPA analysis.

BLM could independently require different actions than those listed under requirements/standards. If, after experience or additional study, BLM concludes that a requirement/standard is not achieving or is unlikely to achieve the protective objective when applied to a specific future on-the-ground action or would not do so as well as the use of recently proven technology or techniques, BLM could at the permitting stage and under the terms of the stipulation or ROP, impose other restrictions to meet the objective.



## Stipulations and Required Operating Procedures

### Waste Prevention, Handling, Disposal, Spills and Public Safety:

#### ***A-1 Required Operating Procedure***

**Objective:** Protect the health and safety of oil field workers and the general public by disposing of solid waste and garbage in accordance with applicable federal, state, and local law and regulations.

**Requirement/Standard:** Areas of operation shall be left clean of all debris.

#### ***A-2 Required Operating Procedure***

**Objective:** Minimize impacts on the environment from non-hazardous and hazardous waste generation. Encourage continuous environmental improvement. Protect the health and safety of oil field workers and the general public. Avoid human-caused changes in predator populations.

**Requirement/Standard:** Lessees/permittees shall prepare and implement a comprehensive waste management plan for all phases of exploration and development, including seismic activities. The plan shall be submitted to the AO for approval, in consultation with federal, state, and NSB regulatory and resource agencies, as appropriate (based on agency legal authority and jurisdictional responsibility), as part of a plan of operations or other similar permit application. Management decisions affecting waste generation shall be addressed in the following order of priority: 1) Prevention and reduction, 2) recycling, 3) treatment, and 4) disposal. The plan shall consider and take into account the following requirements:

- a. Methods to avoid attracting wildlife to food and garbage. All feasible precautions shall be taken to avoid attracting wildlife to food and garbage. (A list of approved precautions, specific to the type of permitted use, can be obtained from the AO.)
- b. Disposal of putrescible waste. Requirements prohibit the burial of garbage. Lessees and permitted users shall have a written procedure to ensure that the handling and disposal of putrescible waste will be accomplished in a manner that prevents the attraction of wildlife. All putrescible waste shall be incinerated, backhauled, or composted in a manner approved by the AO. All solid waste, including incinerator ash, shall be disposed of in an approved waste-disposal facility in accordance with USEPA and ADEC regulations and procedures. The burial of human waste is prohibited except as authorized by the AO.
- c. Disposal of pumpable waste products. Except as specifically provided, the BLM requires that all pumpable solid, liquid, and sludge waste be disposed of by injection in accordance with USEPA, ADEC, and the Alaska Oil and Gas Conservation Commission regulations and procedures. On-pad temporary muds and cuttings storage, as approved by ADEC, will be allowed as necessary to facilitate annular injection and/or backhaul operations.
- d. Disposal of wastewater and domestic wastewater. The BLM prohibits wastewater discharges or disposal of domestic wastewater into bodies of fresh, estuarine, and marine water, including wetlands, unless authorized by a NPDES or state permit.

#### ***A-3 Required Operating Procedure***

**Objective:** Minimize pollution through effective hazardous-materials contingency planning.

**Requirement/Standard:** For oil- and gas-related activities, a Hazardous Materials Emergency Contingency Plan shall be prepared and implemented before transportation, storage, or use of fuel or hazardous substances. The plan shall include a set of procedures to ensure prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of a release. Procedures applicable to fuel and hazardous substances handling (associated with transportation vehicles) shall consist of Best Management Practices (BMPs) if approved by the AO. The plan shall include a list of resources available for response (e.g., heavy-equipment



operators, spill-cleanup materials or companies), and names and phone numbers of federal, state, and NSB contacts. Other federal and state regulations may apply and require additional planning requirements. All appropriate staff shall be instructed regarding these procedures. In addition contingency plans related to facilities developed for oil production shall include requirements to:

- a. Provide refresher spill-response training to NSB and local community spill-response teams on a yearly basis,
- b. Plan and conduct a major spill-response field-deployment drill annually,
- c. Prior to production and as required by law, develop spill prevention and response contingency plans and participate in development and maintenance of the North Slope Subarea Contingency Plan for Oil and Hazardous Substances Discharges/Releases for the National Petroleum Reserve - Alaska operating area. Planning shall include development and funding of detailed (e.g., 1:26,000 scale) environmental sensitivity index maps for the lessee's operating area and areas outside the lessee's operating area that could be affected by their activities. (The specific area to be mapped shall be defined in the lease agreement and approved by the AO in consultation with appropriate resource agencies). Maps shall be completed in paper copy and geographic information system format in conformance with the latest version of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's Environmental Sensitivity Index Guidelines. Draft and final products shall be peer reviewed and approved by the AO in consultation with appropriate federal, state, and NSB resource and regulatory agencies.

#### ***A-4 Required Operating Procedure***

**Objective:** Minimize the impact of contaminants on fish, wildlife, and the environment, including wetlands, marshes and marine waters, as a result of fuel, crude oil, and other liquid chemical spills. Protect subsistence resources and subsistence activities. Protect public health and safety.

**Requirement/Standard:** Before initiating any oil and gas or related activity or operation, including field research/surveys and/or seismic operations, lessees/permittees shall develop a comprehensive spill prevention and response contingency plan per 40 CFR § 112 (Oil Pollution Act). The plan shall consider and take into account the following requirements:

- a. **On-site Clean-up Materials.** Sufficient oil-spill-cleanup materials (absorbents, containment devices, etc...) shall be stored at all fueling points and vehicle-maintenance areas and shall be carried by field crews on all overland moves, seismic work trains, and similar overland moves by heavy equipment.
- b. **Storage Containers.** Fuel and other petroleum products and other liquid chemicals shall be stored in proper containers at approved locations. Except during overland moves and seismic operations, fuel, other petroleum products, and other liquid chemicals designated by the AO that in total exceed 1,320 gallons shall be stored within an impermeable lined and diked area or within approved alternate storage containers, such as over packs, capable of containing 110% of the stored volume. In areas within 500 feet of water bodies, fuel containers are to be stored within appropriate containment.
- c. **Liner Materials.** Liner material shall be compatible with the stored product and capable of remaining impermeable during typical weather extremes expected throughout the storage period.
- d. **Permanent Fueling Stations.** Permanent fueling stations shall be lined or have impermeable protection to prevent fuel migration to the environment from overfills and spills.
- e. **Proper Identification of Containers.** All fuel containers, including barrels and propane tanks, shall be marked with the responsible party's name, product type, and year filled or purchased.



f. Notice of Reportable Spills. Notice of any reportable spill (as required by 40 CFR § 300.125 and 18 AAC § 75.300) shall be given to the AO as soon as possible, but no later than 24 hours after occurrence.

g. Identification of Oil Pans (“duck ponds”). All oil pans shall be marked with the responsible party’s name.

#### ***A-5 Required Operating Procedure***

Objective: Minimize the impact of contaminants from refueling operations on fish, wildlife and the environment.

Requirement/Standard: Refueling of equipment within 500 feet of the active flood plain of any fish-bearing water body and 100 feet of non-fish-bearing water bodies is prohibited. Small caches (up to 210 gallons) for motorboats, float planes, ski planes, and small equipment, e.g. portable generators and water pumps, will be permitted. The AO may allow storage and operations at areas closer than the stated distances if properly designed to account for local hydrologic conditions.

#### ***A-6 Required Operating Procedure***

Objective: Minimize the impact on fish, wildlife, and the environment from contaminants associated with the exploratory drilling process.

Requirement/Standard: Surface discharge of reserve-pit fluids is prohibited.

#### ***A-7 Required Operating Procedure***

Objective: Minimize the impacts to the environment of disposal of produced fluids recovered during the development phase on fish, wildlife, and the environment.

**Requirement/Standard: Discharge of produced water in upland areas and marine waters is prohibited.**

#### ***A-8 Required Operating Procedure***

Objective: Minimize conflicts resulting from interaction between humans and bears during leasing and associated activities.

Requirement: Oil and gas lessees and their contractors and subcontractors will, as a part of preparation of lease operation planning, prepare and implement bear-interaction plans to minimize conflicts between bears and humans. These plans shall include measures to:

- a. Minimize attraction of bears to the drill sites.
- b. Organize layout of buildings and work areas to minimize human/bear interactions.
- c. Warn personnel of bears near or on drill sites and identify proper procedures to be followed.
- d. Establish procedures, if authorized, to discourage bears from approaching the drill site.
- e. Provide contingencies in the event bears do not leave the site or cannot be discouraged by authorized personnel.
- f. Discuss proper storage and disposal of materials that may be toxic to bears.
- g. Provide a systematic record of bears on the site and in the immediate area.

#### **Water Use for Permitted Activities:**

#### ***B-1 Required Operating Procedure***

Objective: Maintain populations of, and adequate habitat for, fish and invertebrates.

Requirement/Standard: Water withdrawal from rivers and streams during winter is prohibited.



### ***B-2 Required Operating Procedure***

**Objective:** Maintain natural hydrologic regimes in soils surrounding lakes and ponds, and maintain populations of, and adequate habitat for, fish and invertebrates, and waterfowl.

**Requirement/Standard:** Water withdrawal from lakes may be authorized on a site-specific basis depending on water volume, and depth, and fish population and species diversification. Current water withdrawal requirements specify:

- a. Lakes that are  $\geq 7$  feet with sensitive fish (any fish except ninespine stickleback or Alaska blackfish), water available for withdrawal is limited to 15% of calculated volume deeper than 7 feet; lakes that are between 5 and 7 feet with sensitive fish, water available for withdrawal would be calculated on a case by case basis.
- b. Lakes that are  $\geq 5$  feet with only non-sensitive fish (i.e., ninespine stickleback or Alaska blackfish), water is available for withdrawal is limited to 30% of calculated volume deeper than 5 feet.
- c. Any lake with no fish present, regardless of depth, water available for withdrawal is up to 35% as specified within the permit.
- d. A water-monitoring plan may be required to assess draw down and water quality changes before, during, and after pumping any fish-bearing lake or lake of special concern.
- e. The removal of naturally grounded ice may be authorized from lakes and shallow rivers on a site-specific basis depending upon its size, water volume, and depth, and fish population and species diversification.
- f. Removed ice aggregate shall be included in the 15% or 30% withdrawal limits—whichever is the appropriate case—unless otherwise approved.
- g. Any water intake structures in fish bearing or non-fish bearing waters shall be designed, operated, and maintained to prevent fish entrapment, entrainment, or injury. Note: All water withdrawal equipment must be equipped and must utilize fish screening devices approved by the Alaska Department of Natural Resources (ADNR).
- h. Compaction of snow cover or snow removal from fish-bearing water bodies shall be prohibited except at approved ice road crossings, water pumping stations on lakes, or areas of grounded ice.

The following lease stipulations and ROPs apply to overland moves, seismic work, and any similar cross-country vehicle use of heavy equipment on non-roaded surfaces during the winter season. These restrictions do not apply to the use of such equipment on ice roads after they are constructed.

### **Winter Overland Moves and Seismic Work:**

### ***C-1 Required Operating Procedure***

**Objective:** Protect grizzly bear, polar bear, and marine mammal denning and/or birthing locations.

**Requirement/Standard:**

- a. Cross-country use of heavy equipment and seismic activities is prohibited within  $\frac{1}{2}$  mile of occupied grizzly bear dens identified by the ADFG unless alternative protective measures are approved by the AO in consultation with the ADFG.
- b. Cross-country use of heavy equipment and seismic activities is prohibited within 1 mile of known or observed polar bear dens or seal birthing lairs. Operators shall consult with the USFWS and/or NOAA Fisheries, as appropriate, before initiating activities in coastal habitat between October 30 and April 15.



**C-2 Required Operating Procedure**

**Objective:** Protect stream banks, minimize compaction of soils, and minimize the breakage, abrasion, compaction, or displacement of vegetation.

**Requirement/Standard:**

- a. Ground operations shall be allowed only when frost and snow cover are at sufficient depths to protect the tundra. Ground operations shall cease when the spring snowmelt begins (approximately May 5 in the foothills area where elevations reach or exceed 500 feet and approximately May 15 in the northern coastal areas). The exact dates will be determined by the AO.
- b. Only low-ground-pressure vehicles shall be used for on-the-ground activities off ice roads or pads. A list of approved vehicles can be obtained from the AO. Limited use of tractors equipped with wide tracks or “shoes” will be allowed to pull trailers, sleighs or other equipment with approved undercarriage. Note: This provision does not include the use of heavy equipment such as front-end loaders and similar equipment required during ice road construction.
- c. Bulldozing of tundra mat and vegetation, trails, or seismic lines is prohibited; however, on existing trails, seismic lines or camps, clearing of drifted snow is allowed to the extent that the tundra mat is not disturbed.
- d. To reduce the possibility of ruts, vehicles shall avoid using the same trails for multiple trips unless necessitated by serious safety or superseding environmental concern. This provision does not apply to hardened snow trails for use by low-ground-pressure vehicles such as Rolligons.
- e. The location of winter ice roads shall be designed and located to minimize compaction of soils and the breakage, abrasion, compaction, or displacement of vegetation. Offsets may be required to avoid using the same route or track in the subsequent year.

**C-3 Required Operating Procedure**

**Objective:** Maintain natural spring runoff patterns, avoid flooding, prevent streambed sedimentation, protect water quality and protect stream banks.

**Requirement/Standard:** Crossing of waterway courses shall be made using a low-angle approach. Snow and ice bridges shall be removed, breached, or slotted before spring breakup. Ramps and bridges shall be substantially free of soil and debris. Except at approved crossings, operators are encouraged to travel a minimum of 100 feet from known overwintering fish streams and lakes.

**C-4 Required Operating Procedure**

**Objective:** Avoid additional freeze-down of deep-water pools harboring over-wintering fish and invertebrates used by fish.

**Requirement/Standard:** Travel up and down streambeds is prohibited unless it can be demonstrated that there will be no additional impacts from such travel to over-wintering fish or the invertebrates they rely on. Rivers and streams shall be crossed at shallow riffles from point bar to point bar whenever possible.



## **Oil and Gas Exploratory Drilling:**

### ***D-1 Lease Stipulation***

Objectives: Protect fish-bearing rivers, streams, and lakes from blowouts and minimize alteration of riparian habitat.

Requirement/Standard: Exploratory drilling is prohibited in rivers and streams, as determined by the active floodplain, and fish-bearing lakes, except where the lessee can demonstrate on a site-specific basis that impacts would be minimal, or it is determined that there is no feasible or prudent alternative.

### ***D-2 Lease Stipulation***

Objective: Minimize surface impacts from exploratory drilling.

Requirement/Standard: Exploratory drilling shall be limited to temporary facilities such as ice pads, ice roads, and ice airstrips, unless the lessee demonstrates that construction of permanent facilities such as gravel airstrips, storage pads, and connecting roads is environmentally preferable or necessary to carry out exploration more economically.

## **Facility Design and Construction:**

### ***E-1 Required Operating Procedure***

Objective: Protect subsistence use and access to traditional subsistence hunting and fishing areas and minimize the impact of oil and gas activities on air, land, water, fish and wildlife resources.

Requirement/Standard: All roads must be designed, constructed, maintained, and operated to create minimal environmental impacts and to protect subsistence use and access to traditional subsistence hunting and fishing areas. Subject to approval by the AO, the construction, operation and maintenance of oil field roads is the responsibility of the lessee. Note: This provision does not apply to intercommunity or other permanent roads constructed with public funds for general transportation purposes. This preserves the opportunity to plan, design and construct public transportation systems to meet the economic, transportation, and public health and safety needs of the State of Alaska and/or communities within the National Petroleum Reserve - Alaska.

### ***E-2 Lease Stipulation***

Objective: Protect fish-bearing water bodies, water quality, and aquatic habitats.

Requirement/Standard: The design and location of permanent oil and gas facilities within 500 feet of fish-bearing or 100 feet of non-fish-bearing water bodies will only be approved on a case by case basis if the lessee can demonstrate that impacts to fish, water quality, and aquatic and riparian habitats are minimal. Note: Also refer to Area-Specific Stipulations and ROPs for Rivers Area (Lease Stipulation K-1) and Deep Water Lakes (Lease Stipulation K-2).

### ***E-3 Lease Stipulation***

Objective: Maintain free passage of marine and anadromous fish and protect subsistence use and access to traditional subsistence hunting and fishing.

Requirement/Standard: Causeways and docks are prohibited in river mouths or deltas. Artificial gravel islands and bottom-founded structures are prohibited in river mouths or active stream channels on river deltas. Causeways, docks, artificial islands, and bottom-founded drilling



structures shall be designed to ensure free passage of marine and anadromous fish and to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics. A monitoring program, developed in consultation with appropriate federal, state, and NSB regulatory and resource agencies, shall be required to address the objectives of water quality and free passage of fish.

#### ***E-4 Required Operating Procedure***

Objective: Minimize the potential for pipeline leaks, the resulting environmental damage and industrial accidents.

Requirement/Standard: All pipelines shall be designed, constructed, and operated under an AO-approved Quality Assurance/Quality Control plan that is specific to the product transported and shall be constructed to accommodate the best available technology for detecting and preventing corrosion or mechanical defects during routine structural integrity inspections.

#### ***E-5 Required Operating Procedure***

Objective: Minimize impacts of the development footprint.

Requirement/Standard: Facilities shall be designed and located to minimize the development footprint to the maximum extent practicable considering environmental, economic, safety, and social impacts. Issues and methods that are to be considered include: a.) use of maximum feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads; b.) sharing facilities with existing development when prudent and technically feasible; c.) collocation of all oil and gas facilities, except airstrips, docks, and seawater-treatment plants, with drill pads; d.) integration of airstrips with roads; e.) use of gravel-reduction technologies, e.g., insulated or pile-supported pads. Note: Where aircraft traffic is a concern, consideration shall be given to balancing gravel pad size and available supply storage capacity with potential reductions in the use of aircraft to support oil and gas operations.

#### ***E-6 Required Operating Procedure***

Objective: Reduce the potential for ice-jam flooding, impacts to wetlands and floodplains, erosion, alteration of natural drainage patterns, and restriction of fish passage.

Requirement/Standard: Stream and marsh crossings shall be designed and constructed to ensure free passage of fish, reduce erosion, maintain natural drainage, and minimize adverse effects to natural stream flow. Note: Bridges, rather than culverts, are the preferred method for crossing rivers. When necessary, culverts can be constructed on smaller streams, if they are large enough to avoid restricting fish passage or adversely affecting natural stream flow.

#### ***E-7 Required Operating Procedure***

Objective: Minimize disruption of caribou movement and subsistence use.

Requirement/Standard: Pipelines and roads shall be designed to allow the free movement of caribou and the safe, unimpeded passage of the public while participating in traditional subsistence activities. Listed below are the accepted design practices:

- a. Above ground pipelines shall be elevated a minimum of 7 feet as measured from the ground to the bottom of the pipeline at vertical support members.
- b. In areas where facilities or terrain may funnel caribou movement, ramps over pipelines, buried pipelines, or pipelines buried under roads may be required by the AO after consultation with federal, state, and NSB regulatory and resource agencies (as appropriate, based on agency legal authority and jurisdictional responsibility).



- c. A minimum distance of 500 feet between pipelines and roads should be maintained when feasible. Separating roads from pipelines may not be feasible within narrow land corridors between lakes and where pipelines and roads converge on a drill pad.

#### ***E-8 Required Operating Procedure***

**Objective:** Minimize the impact of mineral materials mining activities on air, land, water, fish, and wildlife resources.

**Requirement/Standard:** Gravel mine site design and reclamation will be in accordance with a plan approved by the AO. The plan shall be developed in consultation with appropriate federal, state, and NSB regulatory and resource agencies and consider:

- a. Locations outside the active flood plain.
- b. Design and construction of gravel mine sites within active flood plains to serve as water reservoirs for future use.
- c. Potential use of the site for enhancing fish and wildlife habitat.

#### ***E-9 Required Operating Procedure***

**Objective:** Avoidance of human-caused increases in populations of predators of ground nesting birds.

**Requirement/Standard:** Lessee shall utilize best available technology to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes. The lessee shall provide the AO with an annual report on the use of oil and gas facilities by ravens, raptors and foxes as nesting, denning, and shelter sites.

#### ***E-10 Required Operating Procedure***

**Objective:** Prevention of migrating waterfowl, including species listed under the Endangered Species Act, from striking oil and gas and related facilities during low light conditions.

**Requirement/Standard:** Except for safety lighting, illumination of higher structures shall be designed to direct artificial exterior lighting inward and downward, rather than upward and outward. All drilling structures, production facilities, and other structures that exceed 20 feet in height shall be illuminated as outlined above.

#### ***E-11 Required Operating Procedure***

**Objective:** Minimize the take of species listed under the Endangered Species Act and minimize the disturbance of other species of interest from direct or indirect interaction with oil and gas facilities.

**Requirement/Standard:** In accordance with the guidance below, before the approval of facility construction, aerial surveys of breeding pairs of the following species shall be conducted within any area proposed for development.

##### **Special Conditions in Spectacled and/or Steller's Eiders Habitats:**

- a. Surveys shall be conducted by the lessee for at least 3 years before authorization of construction, if such construction is within the USFWS North Slope eider survey area and at least 1 year outside that area. Results of aerial surveys and habitat mapping may require additional ground nest surveys. Spectacled and/or Steller's eider surveys shall be conducted following accepted BLM-protocol during the second week of June.
- b. If spectacled and/or Steller's eiders are determined to be present within the proposed development area, the applicant shall consult with the USFWS and BLM in the design and placement of roads and facilities in order to minimize impacts to nesting and brood-rearing eiders and their preferred habitats. Such consultation shall address timing restrictions and other temporary mitigating measures, construction of permanent facilities, placement of fill, alteration of eider habitat, aircraft operations, and introduction of high noise levels.



c. To reduce the possibility of spectacled and/or Steller's eiders striking above ground utility lines (power and communication), such lines shall either be buried in access roads, or suspended on vertical support members, to the extent practical. Support wires associated with communication towers, radio antennas, and other similar facilities, shall be clearly marked along their entire length to improve visibility for low flying birds. Such markings shall be jointly developed through consultation with the USFWS. Overhead power and/or communication lines for oil and gas activities will be limited to the following circumstances.

1. Overhead power or communication lines may be allowed when located entirely within the boundaries of a facility pad;
2. Overhead power or communication lines may be allowed when engineering constraints at the specific location make it unfeasible to bury or connect them to a vertical support member, or
3. Overhead power or communication lines may be allowed when human safety would be compromised by other methods. (Note: Unlike the case with the first two circumstances listed immediately above, this circumstance may justify overhead power or communications lines over a larger portion of the Planning Area.)

**Special Conditions in Yellow-billed Loon Habitats:**

- a. Aerial surveys shall be conducted by the lessee for at least 3 years before authorization of construction of facilities proposed for development which are within 1 mile of a lake 25 acres or larger in size. These surveys along shorelines of large lakes shall be conducted following accepted BLM protocol during nesting in late June and during brood rearing in late August.
- b. Should yellow-billed loons be present, the design and location of facilities must be such that disturbance is minimized. Accepted mitigation is a 1-mile buffer around all recorded nest sites and a minimum 1,625-foot (500-meter) buffer around the remainder of the lake shoreline. Development may be prohibited within buffers or activities curtailed while birds are present.

***E-12 Required Operating Procedure***

**Objective:** Use ecological mapping as a tool to assess wildlife habitat before development of permanent facilities, to conserve important habitat types during development.

**Requirement/Standard:** An ecological land classification map of the development area shall be developed before approval of facility construction. The map will integrate geomorphology, surface form, and vegetation at a scale, level of resolution, and level of positional accuracy adequate for detailed analysis of development alternatives. The map shall be prepared in time to plan one season of ground-based wildlife surveys, if deemed necessary by the AO, before approval of the exact facility location and facility construction.

***E-13 Required Operating Procedure***

**Objective:** Protect cultural and paleontological resources.

**Requirement/Standard:** Lessees shall conduct a cultural and paleontological resources survey prior to any ground-disturbing activity. Upon finding any potential cultural or paleontological resource, the lessee or their designated representative shall notify the AO and suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the AO.

**Use of Aircraft for Permitted Activities:**

***F-1 Required Operating Procedure***

**Objective:** Minimize the effects of low-flying aircraft on wildlife, traditional subsistence activities, and local communities.



**Requirement/Standard:** The lessee shall ensure that aircraft used for permitted activities maintain altitudes according to the following guidelines:

- a. Aircraft shall maintain an altitude of at least 1,500 feet above ground level (AGL) when within ½ mile of cliffs identified as raptor nesting sites from April 15 through August 15 and within ½ mile of known gyrfalcon nest sites from March 15 to August 15, unless doing so would endanger human life or violate safe flying practices. Permittees shall obtain information from the BLM necessary to plan flight routes when routes may go near falcon nests.
- b. Aircraft shall maintain an altitude of at least 1,000 feet AGL (except for takeoffs and landings) over caribou winter ranges from October 1 through May 1, unless doing so would endanger human life or violate safe flying practices. Caribou wintering areas will be defined annually by the AO.
- c. The number of takeoffs and landings to support oil and gas operations with necessary materials and supplies should be limited to the maximum extent possible. During the design of proposed oil and gas facilities, larger landing strips and storage areas should be considered so as to allow larger aircraft to be employed, resulting in fewer flights to the facility.
- d. Use of aircraft, especially rotary wing aircraft, near known subsistence camps and cabins or during sensitive subsistence hunting periods (spring goose hunting and fall caribou and moose hunting) should be kept to a minimum.
- e. Aircraft used for permitted activities shall maintain an altitude of at least 2,000 feet AGL (except for takeoffs and landings) over the Teshekpuk Lake Caribou Habitat Area (Map 2-2) from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices. Aircraft use (including fixed wing and helicopter) by oil and gas lessees in the Goose Molting Area (Map 2-2) should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.

## **Oil Field Abandonment:**

### ***G-1 Lease Stipulation***

**Objective:** Ensure the final disposition of the land meets the current and future needs of the public.

**Requirement/Standard:** Upon abandonment or expiration of the lease, all oil- and gas-related facilities shall be removed and sites rehabilitated to as near the original condition as practicable, subject to the review of the AO. The AO may determine that it is in the best interest of the public to retain some or all facilities.

## **Subsistence Consultation for Permitted Activities:**

### ***H-1 Required Operating Procedure***

**Objective:** Provide opportunities for participation in planning and decision making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities.

**Requirement/Standard:** Lessee/permittee shall consult directly with affected communities using the following guidelines:

- a. Before submitting an application to the BLM, the applicant shall consult with directly affected subsistence communities, the NSB, and the National Petroleum Reserve - Alaska Subsistence Advisory Panel to discuss the siting, timing and methods of proposed operations. Through this consultation, the applicant shall make every reasonable effort, including such mechanisms as conflict avoidance agreements and mitigating measures, to ensure that proposed activities will not result in unreasonable interference with subsistence activities.



b. The applicant shall submit documentation of consultation efforts as part of its operations plan. Applicants should submit the proposed plan of operations to provide an adequate time for review and comment by the National Petroleum Reserve - Alaska Subsistence Advisory Panel and to allow time for formal Government-to-Government consultation with Native Tribal governments. The applicant shall submit documentation of its consultation efforts and a written plan that shows how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence activities. Operations plans must include a discussion of the potential effects of the proposed operation, and the proposed operation in combination with other existing or reasonably foreseeable operations.

c. A subsistence plan addressing the following items must be submitted:

1. A detailed description of the activity(ies) to take place (including the use of aircraft).
2. A description of how the lessee/permittee will minimize and/or deal with any potential impacts identified by the AO during the consultation process.
3. A detailed description of the monitoring effort to take place, including process, procedures, personnel involved and points of contact both at the work site and in the local community.
4. Communication elements to provide information on how the applicant will keep potentially affected individuals and communities up-to-date on the progress of the activities and locations of possible, short-term conflicts (if any) with subsistence activities. Communication methods could include holding community meetings, open house meetings, workshops, newsletters, radio and television announcements, etc.
5. Procedures necessary to facilitate access by subsistence users to conduct their activities.

In the event that no agreement is reached between the parties, the AO shall consult with the directly involved parties and determine which activities will occur, including the timeframes. During development, monitoring plans must be established for new permanent facilities, including pipelines, to assess an appropriate range of potential effects on resources and subsistence as determined on a case-by-case basis given the nature and location of the facilities. The scope, intensity, and duration of such plans will be established in consultation with the AO and Subsistence Advisory Panel.

## ***H-2 Required Operating Procedure***

**Objective:** Prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration.

**Requirement/Standard:** In addition to the consultation process described above for permitted activities, before applying for permits to conduct geophysical (seismic) exploration, the applicant shall consult with local communities and residents.

## **Orientation Programs Associated with Permitted Activities:**

### ***I-1 Required Operating Procedure***

**Objective:** Minimize cultural and resource conflicts.

**Requirement/Standard:** All personnel involved in oil and gas and related activities shall be provided information concerning applicable stipulations, ROPs, standards, and specific types of environmental, social, traditional, and cultural concerns that relate to the region. The lessee/permittee shall ensure that all personnel involved in permitted activities shall attend an orientation program at least once a year. The proposed orientation program shall be submitted to the AO for review and approval and should:

- a. Provide sufficient detail to notify personnel of applicable stipulations and ROPs as well as inform individuals working on the project of specific types of environmental, social, traditional and cultural concerns that relate to the region.



- b. Address the importance of not disturbing archaeological and biological resources and habitats, including endangered species, fisheries, bird colonies, and marine mammals, and provide guidance on how to avoid disturbance.
- c. Include guidance on the preparation, production, and distribution of information cards on endangered and/or threatened species.
- d. Be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which personnel will be operating.
- e. Include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation.
- f. Include information for aircraft personnel concerning subsistence activities and areas/seasons that are particularly sensitive to disturbance by low-flying aircraft. Of special concern is aircraft use near traditional subsistence cabins and campsites, flights during spring goose hunting and fall caribou and moose hunting seasons, and flights near North Slope communities.
- g. Provide that individual training is transferable from one facility to another except for elements of the training specific to a particular site.
- h. Include on-site records of all personnel who attend the program for so long as the site is active, though not to exceed the 5 most recent years of operations. This record shall include the name and dates(s) of attendance of each attendee.
- i. Include a module discussing bear interaction plans to minimize conflicts between bears and humans.

#### **Endangered Species Act—Section 7 Consultation Process:**

**J:** The lease areas may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or to have some other special status. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activities that will contribute to the need to list such a species or their habitat. BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.

#### **Lease Stipulations that Apply in Biologically Sensitive Areas:**

##### ***K-1 Lease Stipulation - Rivers***

**Objective:** Minimize the disruption of natural flow patterns and changes to water quality; the disruption of natural functions resulting from the loss or change to vegetative and physical characteristics of floodplain and riparian areas; the loss of spawning, rearing or over-wintering habitat for fish; the loss of cultural and paleontological resources; the loss of raptor habitat; impacts to subsistence cabin and campsites; the disruption of subsistence activities; and impacts to scenic and other resource values.

**Requirement/Standard:** Permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines, are prohibited in the streambed and adjacent to the rivers listed below at the distances identified. (Gravel mines may be located within the active flood plain consistent with ROP E-8.) With the exception of the Ikpikpuk River, these setbacks are measured from the



bank of the river as determined by the hydrology at the time of application. The standard setback is  $\frac{1}{2}$  mile (from the bank's highest high water mark) and increased to  $\frac{3}{4}$  mile (from the bank's highest high water mark) where subsistence cabin and campsites are numerous. Along the Colville River and a portion of the Ikpihpuk a 1-mile (from the bank's highest high water mark) setback is required to protect important raptor habitat (for locations along rivers where setback distances change). On a case-by case basis, and in consultation with federal, state, and NSB regulatory and resource agencies (as appropriate, based on agency legal authority and jurisdictional responsibility), essential pipeline and road crossings to the main channel will be permitted (unless noted otherwise) through setback areas. The above setbacks may not be practical within river deltas. In these situations, permanent facilities shall be designed to withstand a 200-year flood event.

a. **Colville River:** a 1-mile setback from the northern bluff (or bank if there is no bluff) of the Colville River extending the length of that portion of the river located within the Planning Area. Note: The Planning Area excludes conveyed Native lands along the lower reaches of the Colville River. Development of road crossings intended to support oil and gas activities shall be consolidated with other similar projects and uses to the maximum extent possible. Note: This provision does not apply to intercommunity or other permanent roads constructed with public funds for general transportation purposes. This preserves the opportunity to plan, design, and construct public transportation systems to meet the economic, transportation, and public health and safety needs of the State of Alaska and/or communities within National Petroleum Reserve - Alaska.

b. **Ikpihpuk River:** a  $\frac{3}{4}$ -mile setback from each side of the centerline (1 $\frac{1}{2}$  miles total) of the Ikpihpuk River extending from the mouth south to Sec. 19, T. 7 N., R. 11 W., U.M. (Umiat Meridian). From Sec. 19, T. 7 N., R. 11 W., U.M., to Sec. 4, T. 3 N., R. 12 W., U.M., a 1-mile setback is required. Beginning at Sec. 4, T. 3 N., R. 12 W., U.M., a  $\frac{1}{2}$ -mile setback from the centerline (1 mile total) will be required to the confluence of the Kigalik River and Maybe Creek. Note: The setback distances only apply to the east bank where the Ikpihpuk River is the Planning Area boundary.

c. **Miguakiak River:** a  $\frac{1}{2}$ -mile setback from the bank's highest high water mark.

d. **Kikiakrorak and Kogosukruk Rivers:** Note: The following discussion refers only to portions of the Kikiakrorak River downstream from T. 2 N., R. 4 W., U.M. and the Kogosukruk River (including the four tributaries off the southern bank) downstream from T. 2 N., R. 3 W., U.M.. No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within 1 mile of the top of the bluff (or bank if there is no bluff) on either side of the rivers and several of the Kogosukruk tributaries.

e. **Fish Creek:** No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within 3 miles (from the bank's highest high water mark) of the creek downstream from the eastern edge of Sec. 31, T. 11 N., R. 1 E., U.M. or within  $\frac{1}{2}$  mile (from the bank's highest high water mark) of the creek farther upstream.

f. **Judy Creek:** a  $\frac{1}{2}$ -mile setback from the banks' highest high water mark extending from the mouth to the confluence of an unnamed tributary in Sec. 8, T8N., R.2W., Umiat Meridian.

g. **Tingmiaksiqvik River:** No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within  $\frac{1}{2}$  mile (from the bank's highest high water mark) of this river from its headwaters within Sec. 13, T. 7 N., R. 1 W., U.M. downstream to its confluence with Fish Creek. Note: This stipulation applies only to Alternative B.

### ***K-2 Lease Stipulation—Deep Water Lakes***

Objective: Minimize the disruption of natural flow patterns and changes to water quality; the disruption of natural functions resulting from the loss or change to vegetative and physical characteristics of deep water lakes; the loss of spawning, rearing or over wintering habitat for



fish; the loss of cultural and paleontological resources; impacts to subsistence cabin and campsites; and the disruption of subsistence activities.

Requirement/Standard: Permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines, are prohibited on the lake or lakebed and within ¼ mile of the ordinary high water mark of any deep lake as determined to be in lake zone III (i.e., depth greater than 13 feet [4 meters]; Mellor 1985). On a case-by case basis, and in consultation with federal, state and NSB regulatory and resource agencies (as appropriate based on agency legal authority and jurisdictional responsibility), essential pipeline, road crossings, and other permanent facilities may be permitted through or in these areas where the lessee can demonstrate on a site-specific basis that impacts would be minimal or if it is determined that there is no feasible or prudent alternative.

### ***K-3 Stipulation - Teshekpuk Lake***

Teshekpuk Lake contains sensitive biological resources and/or subsistence concerns. The standard(s) for exploration and development activities are set high with the burden of proof resting with the lessee to demonstrate to the AO that granting an approval for exploration and/or development is warranted.

Objective: Protect fish and wildlife habitat, preserve air and water quality, and minimize impacts to traditional subsistence activities and historic travel routes on Teshekpuk Lake.

Requirement/Standard (Exploration): Requests for approval of any activities must be submitted in advance and must be accompanied by evidence and documentation that demonstrates to the satisfaction of the AO that the actions or activities meet all of the following criteria:

- a. Exploration activities will not unreasonably conflict with traditional subsistence uses or significantly impact seasonally concentrated fish and wildlife resources.
- b. There is adequate spill response capability to effectively respond during periods of broken ice and/or open water or, the availability of alternative methods to prevent well blowouts during periods when adequate response capability cannot be demonstrated. Such alternative methods may include improvements in blowout prevention technology, equipment, and/or changes in operational procedures, and “top-setting” of hydrocarbon-bearing zones.
- c. Reasonable efforts to avoid or minimize impacts related to oil spill response activities, including vessel, aircraft, and pedestrian traffic will be made to minimize additional impacts or further compounding of “direct spill”-related impacts on area resources and subsistence uses.
- d. The location of exploration and related activities shall be sited so as to not pose a hazard to navigation by the public using high-use traditional subsistence-related travel routes on Teshekpuk Lake, recognizing that marine and near-shore travel routes change over time, subject to shifting environmental conditions.

Requirement/Standard (Development): With the exception of linear features such as pipelines and causeways, permanent oil and gas platforms or production equipment would not be permitted on or under the water within ¾ mile of the shoreline, and on land ¼ mile landward of the shoreline of Teshekpuk Lake. Activities will only be permitted if they can meet all the following criteria:

- a. Design and construction of facilities shall minimize impacts to traditional subsistence uses, travel corridors, and seasonally concentrated fish and wildlife resources.
- b. Daily operational activities, including use of support vehicles, watercraft, and aircraft traffic, alone or in combination with other past, present, and reasonably foreseeable activities, shall be conducted to minimize impacts to traditional subsistence uses, travel corridors, and seasonally concentrated fish and wildlife resources.
- c. The location of oil and gas facilities, including artificial islands, platforms, associated pipelines, ice or other roads, bridges or causeways, shall be sited and constructed so as to not



pose a hazard to navigation by the public using traditional high-use subsistence-related travel routes into and through Teshekpuk Lake.

d. Demonstrated year-round oil spill response capability, including the capability of adequate response during periods of broken ice or open water, or the availability of alternative methods to prevent well blowouts during periods when adequate response capability cannot be demonstrated. Such alternative methods may include seasonal drilling restrictions, improvements in blowout prevention technology, equipment and/or changes in operational procedures, and “top-setting” of hydrocarbon-bearing zones.

e. Reasonable efforts will be made to avoid or minimize impacts related to oil spill response activities, including vessel, aircraft, and pedestrian traffic that add to impacts or further compound “direct spill” related impacts on area resources and subsistence uses.

#### ***K-4 Lease Stipulation - Goose Molting Area***

**Objective:** Minimize disturbance to molting geese and loss of goose molting habitat in and around lakes in the Goose Molting Area.

**Requirement/Standard:** In goose molting habitats, the following standards will be followed for permitted activities:

a. Water extraction from any lake used by molting geese shall not alter hydrological conditions that could adversely affect identified goose-feeding habitat along lakeshore margins.

Considerations will be given to seasonal use by operators (generally in winter) and geese (generally in summer), as well as recharge to lakes from the spring snowmelt.

b. From May 20 through August 20 drilling other than from current production pads is prohibited. The intent of this rule is to restrict exploration drilling during the period when geese are present. There are no seasonal restrictions on development or exploration drilling for fields in operation.

c. Oil and gas exploration and development activities will avoid alteration (e.g., damage or disturbance of soils, vegetation, or surface hydrology) of critical goose-feeding habitat types along lakeshore margins (grass/sedge/moss), as identified by the AO in consultation with the USFWS.

d. Permanent oil and gas facilities (including gravel roads, pads, and airstrips but excluding pipelines) and material sites will be sited to meet the stated objective. With the exception of linear features such as pipelines and causeways, permanent oil and gas platforms or production equipment would not be permitted on or under the water within  $\frac{3}{4}$  mile of the shoreline, and on land  $\frac{1}{4}$  mile landward of the shoreline of goose molting lakes. Goose Molting Area lakes shall be identified by the AO in consultation with appropriate federal, state, and NSB regulatory and resource agencies.

e. Oil and gas facility layout located within  $1\frac{1}{2}$  miles of a Goose Molting Area lake from May 20 through August 20 shall incorporate features (e.g., temporary fences, siting/orientation) that screen/shield human activity from view of any Goose Molting Area lake, as identified by the AO in consultation with appropriate federal, state, and NSB regulatory and resource agencies.

f. Major construction activities using heavy equipment (e.g., sand/gravel extraction and transport, pipeline and pad construction, but not drilling from existing production pads) shall be suspended within  $1\frac{1}{2}$  mile of the Goose Molting Area lakes from May 20 through August 20, unless approved by the AO in consultation with the appropriate federal, state, and NSB regulatory and resource agencies.

g. Strategies to minimize ground traffic will be implemented from May 20 through August 20. These strategies may include limiting trips, use of convoys, different vehicle types, etc. to the extent practicable.



- h. Nonessential helicopter overflights by oil and gas lessees and all other users shall be reviewed and may be suspended in and around Goose Molting Area lakes from May 20 through August 20.
- i. Within the Goose Molting Area, use of fixed-wing aircraft by authorized users shall be restricted from May 20 to August 20. Restrictions may include 1) limited to two round-trip flights/week, and 2) restricted to flight corridors will be established by the BLM after discussions with appropriate federal, state, and NSB regulatory and resource agencies. Note: This site-specific stipulation is not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of this stipulation. However, flights necessary to gain this information would be restricted to the minimum necessary to collect such data.

***K-5 Lease Stipulation - Teshekpuk Lake Caribou Habitat Area***

**Objective:** Minimize disturbance and hindrance of caribou, or alteration of caribou movements through portions the Teshekpuk Lake Caribou Habitat Area that are essential for all season use, including calving and rearing, insect-relief, and migration.

**Requirement/Standard:** In the Teshekpuk Lake Caribou Habitat Area the following standards will be applied to permitted activities:

- a. Before authorization of construction of permanent facilities, the lessee shall design and implement a study of caribou movement unless an acceptable study(s) has been completed within the last 10 years. The study shall include a minimum of 3 years of current data on caribou movements and the study design shall be approved by the AO and should provide information necessary to determine facility (including pipeline) design and location. Lessees may submit individual study proposals or they may combine with other lessees in the area to do a single, joint study for the entire Teshekpuk Lake Caribou Habitat Area. Study data may be gathered concurrently with other activities.
- b. From May 20 through August 20, exploratory drilling will be allowed only from current production pads or platforms sited within a lake body, in compliance with setback requirements set forth in other stipulations.
- c. Within the Teshekpuk Lake Caribou Habitat Area, lessees shall orient linear corridors when laying out oil field developments to the extent practicable, to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities.
- d. Ramps over pipelines, buried pipelines, or pipelines buried under the road may be required by the AO, after consultation with appropriate federal, state, and NSB regulatory and resource agencies, in the Teshekpuk Lake Caribou Habitat Area where pipelines potentially impede caribou movement.
- e. The following ground-traffic restrictions shall apply to permanent oil and gas-related roads in the areas and time periods indicated:
  - 1. Within the Teshekpuk Lake Caribou Habitat Area, from May 20 through August 20, traffic speed shall not exceed 15 miles per hour when caribou are within ½ mile on the road. Additional strategies may include limiting trips, using convoys, using different vehicle types, etc., to the extent practicable.
  - 2. The lessee or a contractor shall observe caribou movement from May 20 through August 20. Based on these observations, traffic will be stopped temporarily to allow a crossing by 10 or more caribou. Sections of road will be evacuated when migrations of large numbers of caribou appears to imminent.
  - 3. Major equipment, materials, and supplies to be used at oil and gas work sites in the Teshekpuk Lake Caribou Habitat Area shall be stockpiled prior to or after the period of May 20 through August 20 to minimize road traffic during that period.



4. Use of aircraft larger than a Twin Otter by authorized users of the Planning Area, including oil and gas lessees, from May 20 through August 20 within the Teshekpuk Lake Caribou Habitat Area, shall be for emergency purposes only.
5. Fixed-wing aircraft takeoffs and landings by authorized users of the Planning Area shall be limited to an average of one round-trip flight per day from May 20 through June 20, at aircraft facilities within the Teshekpuk Lake Caribou Habitat Areas.
6. Aircraft shall maintain a minimum height of 1,000 feet AGL (except for takeoffs and landings) over caribou winter ranges from October 1 through May 1, and 2,000 feet AGL over the Teshekpuk Lake Caribou Habitat Area from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.

#### ***K-6 Stipulation – Coastal Area***

**Objective:** Minimize hindrance or alteration of caribou movement within caribou coastal insect-relief areas; to prevent contamination of marine waters; loss of important bird habitat; alteration or disturbance of shoreline marshes; and impacts to subsistence resources activities.

**Requirement/Standard:** In the Coastal Area, permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines established to support exploration and development activities shall be located at least  $\frac{3}{4}$  mile inland from the coastline to the extent practicable. Where, as a result of technological limitations, economics, logistics, or other factors, a facility must be located within  $\frac{3}{4}$  mile inland of the coastline, the practicality of locating the facility at previously occupied sites such as Camp Lonely, various Husky/USGS drill sites, and Distant Early Warning (DEW)-Line sites, shall be considered. Use of existing sites within  $\frac{3}{4}$  mile of the coastline shall also be acceptable where it is demonstrated that use of such sites will reduce impacts to shorelines or otherwise be environmentally preferable. All lessees/permittees involved in activities in the immediate area must coordinate use of these new or existing sites with all other prospective users. Before conducting open water activities, the lessee shall consult with the Alaska Eskimo Whaling Commission, the Nuiqsut Whaling Association, and the NSB to minimize impacts to the fall and spring subsistence whaling activities of the communities of the North Slope.

#### ***K-7 Lease Stipulation - Colville River Special Area***

**Objective:** Prevent or minimize loss of raptor foraging habitat.

**Requirement/Standard:** If necessary to construct permanent facilities within the Colville River Special Area, all reasonable and practicable efforts shall be made to locate permanent facilities as far from raptor nests as feasible. Within 15 miles of raptor nest sites, significant alteration of high quality foraging habitat shall be prohibited unless the lessee can demonstrate on a site-specific basis that impacts would be minimal or it is determined that there is no feasible or prudent alternative. Of particular concern are ponds, lakes, wetlands, and riparian habitats.

**Note:** On a case-by case basis, and in consultation with appropriate federal and state regulatory and resource agencies, essential pipeline and road crossings will be permitted through these areas where no other feasible or prudent options are available.

a. The following restrictions apply to overland moves, seismic work, and any similar use of heavy equipment (other than actual excavations as part of construction) on tundra surfaces during the winter season:

1. Motorized ground-vehicle use shall be minimized within the Colville River Raptor, Passerine, and Moose Area from April 15 through August 5, with the exception that use will be minimized in the vicinity of gyrfalcon nests beginning March 15. Such use will remain  $\frac{1}{2}$  mile away from known raptor nesting sites, unless authorized by the AO.



***K-8 Lease Stipulation - Pik Dunes***

**Objective:** Retain unique qualities of the Pik Dunes, including geologic and scenic uniqueness, insect-relief habitat for caribou, and habitat for several uncommon plant species.

**Requirement/Standard:** Surface structures, except approximately perpendicular pipeline crossings and ice pads, are prohibited within the Pik Dunes.

**Summer Vehicle Tundra Access:**

***L-1 Required Operating Procedure***

**Objective:** Protect stream banks and water quality; minimize compaction and displacement of soils; minimize the breakage, abrasion, compaction, or displacement of vegetation; protect cultural and paleontological resources; maintain populations of, and adequate habitat for birds, fish, and caribou and other terrestrial mammals; and minimize impacts to subsistence activities.

**Requirement/Standard:** On a case-by-case basis, BLM may permit low-ground-pressure vehicles to travel off of gravel pads and roads during times other than those identified in ROP C-2a. Permission for such use would only be granted after an applicant has:

- a. Submitted studies satisfactory to the AO of the impacts on soils and vegetation of the specific low-ground-pressure vehicles to be used. These studies should reflect use of such vehicles under conditions similar to those of the route proposed for use and should demonstrate that the proposed use would have no more than minimal impacts to soils and vegetation.
- b. Submitted surveys satisfactory to the AO of subsistence uses of the area as well as of the soils, vegetation, hydrology, wildlife and fish (and their habitats), paleontological and archaeological resources, and other resources as required by the AO.
- c. Designed and/or modified the use proposal to minimize impacts to the AO's satisfaction. Design steps to achieve the objectives and based upon the studies and surveys may include, but not be limited to, timing restrictions (generally it is considered inadvisable to conduct tundra travel prior to August 1 to protect ground-nesting birds), shifting of work to winter, rerouting, and not proceeding when certain wildlife are present or subsistence activities are occurring. At the discretion of the AO, the plan for summer tundra vehicle access may be included as part of the spill prevention and response contingency plan required by 40 CFR 112 (Oil Pollution Act) and ROP A-4.



## **Appendix F: Alternative D Stipulations and Required Operating Procedures**







## APPENDIX F

# ALTERNATIVE D STIPULATIONS AND REQUIRED OPERATING PROCEDURES

### Definitions

The following definitions in the context of this document, apply to general lease stipulations and site specific lease stipulations (K-Lease stipulations) and Required Operating Procedures (ROPs):

**Active Floodplain:** The lowland and relatively flat areas adjoining inland and coastal waters, including the flood-prone areas of offshore islands, composing, at a minimum, that area subject to a 1% or greater chance of flooding in any given year (also referred to as the 100-year or base floodplain).

**Authorized Officer (AO):** A position of authority for approval of various activities through delegation from the Secretary of the Interior. Currently, the designated AOs in the State of Alaska for leasing, surface use, and permitting are 1) State Director, 2) Manager of the Fairbanks District Office in Fairbanks, and 3) Deputy State Director, Division of Energy and Solid Minerals.

**Body of Water or Water body:** A lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life.

**Buffer:** A zone extending outward or inward from the periphery of a “protected” feature for a specified distance. Activities and development may be prohibited or limited by type or time within the buffer dependent on the goal associated with applying the buffer.

**Consultation:** Consultation, as it is referenced in the lease stipulations, does not infer formal consultation as required under other legal mandates such as “Section 7 Consultation” under the ESA. Rather, consultation implies that the BLM or the Lessee/Permittee will contact other agencies or entities to either inform them of potential actions and/or to seek input on noted topics. This includes informal contacts, and written, electronic, and/or verbal communication.

**Development Activities:** Any activity associated with construction and operation of facilities or equipment post exploration.

**Field:** The term used to describe the area containing surface infrastructure above one or more subsurface reservoirs. In this sense, “field” is analogous to “a Unit participating area or collection of participating areas.” The infrastructure in the field includes, but is not limited to, drilling and production pads, service roads, perhaps an airstrip, and processing and support facilities. Field infrastructure may be used in the development and production of several oil/gas accumulations in different subsurface reservoirs. Fields typically have a primary reservoir that supports initial development in addition to satellite reservoirs that are developed later and tie into the main facilities. Although oil and gas reservoirs may vary greatly in subsurface depth



and other geologic characteristics, because they are located in the same geographic area it is more efficient to coordinate and share the necessary surface infrastructure. Fields may or may not be connected by permanent roads to adjacent fields or transportation facilities outside the field area.

**In-field Roads:** “In-field roads” are a component of the potential “footprint” of permanent oil and gas facilities. BLM defines “in-field roads” as gravel roads utilized by industry to conduct operational activities associated with development and production activities. The actual length/width and construction details of any gravel used for roads will be required as a component of any permit application for permanent facilities.

**Lease Stipulation:** Mitigation developed through BLM planning process/NEPA process that is specifically attached to any lease issued in the Northeast Planning Area.

**Restricted Surface Occupancy:** No permanent oil and gas facilities, except pipelines and in some cases roads, will be allowed.

**Permanent Oil and Gas Facilities:** Permanent Facilities include production facilities, pipelines, roads, airstrips, production pads, docks and other bottom-founded structures, seawater-treatment plants, and other structures associated with an oil and gas operation that occupy land for more than one winter season; also included are material sites such as sand and gravel, and “temporary platforms” if those platforms are used for production rather than exploration. Exploration wellheads and seasonal facilities such as ice roads and ice pads are excluded, even when the pads are designed for use in successive winters. This definition does not include over-summering ice pads for exploration purposes.

**Required Operating Procedure:** Mitigation developed through the BLM planning process/NEPA process that is not attached to the oil and gas lease but is required, implemented and enforced at the operational level for all authorized (not just oil and gas) activities in the Planning Area.

**Compliance with Required Operating Procedures:** Required Operating Procedures were developed with various mechanisms in place to ensure compliance. These mechanisms include the following:

- 1) Some ROPs are pre-application requirements; therefore compliance will precede approval of the proposed activity. For example, ROP H-1 a. requires consultation with affected communities prior to submission of an application for relevant activities within the Northeast Planning Area. If consultation has not taken place, the application will be rejected or will be considered incomplete until such time that the consultation has occurred.
- 2) Other ROPs are required design features, and will have to be incorporated into the applicant’s proposal. As an integral part of the proposal and the authorization, the requirement does not need to be stipulated to be enforceable. For example, a minimum pipeline height of 7 feet for above ground pipelines is a required design of any approved above ground pipeline (ROP E-7). Since the authorization (a ROW in this case) authorizes a pipeline with a minimum height of 7 feet, anything less (unless specifically approved through additional NEPA analysis and the permit) is not in compliance and enforcement actions may be taken even if the permit does not specify a minimum of 7 feet.



- 3) Other ROPs will become conditions of approval on post oil and gas lease land use authorizations and they will be enforceable. For example, ROP C-1 prohibits heavy equipment used for cross-country moves within ½ mile of occupied grizzly bear dens.

**Site Specific Lease Stipulation (K-Stipulations):** A mitigation measure developed through the BLM planning process/NEPA process attached only to leases issued within spatially defined areas in the Northeast Planning Area (See Map 1).

**Temporary Platform:** A facility that does not require the use of an ice or gravel pad to support oil and gas and related exploration activities. An example of a temporary platform recently used on the North Slope is Anadarko Petroleum's Arctic Drilling Platform used for the company's Hot Ice Project during the winters of 2003-2004. The facility consisted of a series of platform modules joined together and supported above the tundra surface on steel legs. Once the project was completed the platform was disassembled and the support legs were removed, leaving the tundra surface undisturbed. Note: A temporary platform that is used for production, as opposed to exploration, would be considered a permanent oil and gas facility and be subject to the restrictions on placement of such structures.

### **Applicability of Requirements/Standards**

All surface disturbing activities such as exploratory drilling, road/pipeline construction, seismic acquisition, and overland moves require additional authorization(s) issued subsequent to leasing. The stipulations and ROPs require that certain protections of resources and uses be achieved. Requirements and standards listed with the stipulations and ROPs represent BLM's current understanding of how lessees/permittees would achieve the objectives of the stipulation or ROP.

A lessee/permittee may propose a deviation from the requirements/standards of stipulations and ROPs as part of an authorization application. Prior to approving an alternative procedure as part of the authorization, BLM's staff would analyze the proposal and determine if the proposal incorporating the alternative procedure would achieve the objectives of the stipulations and ROPs. If the BLM determines that the alternative procedure proposed by the applicant would meet the stipulation's or ROP's objective, BLM could approve the alternative procedure.

If BLM determines that the alternative procedure proposed by the applicant is unlikely to meet the objectives of a stipulation or ROP, the AO may allow a deviation from the objectives and requirement/standard in a new decision document supported by additional NEPA analysis.

The BLM could independently require different actions than those listed under requirements/standards. If, after experience or additional study, BLM concludes that a requirement/standard is not achieving or is unlikely to achieve the protective objective when applied to a specific future on-the-ground action or would not do so as well as the use of recently proven technology or techniques, BLM could at the permitting stage and under the terms of the stipulation or ROP, impose other restrictions to meet the objective.



## Stipulations and Required Operating Procedures

### Waste Prevention, Handling, Disposal, Spills and Public Safety:

#### ***A-1 Required Operating Procedure***

Objective: Protect the health and safety of oil field workers and the general public by disposing of solid waste and garbage in accordance with applicable Federal, state, and local law and regulations.

Requirement/Standard: Areas of operation shall be left clean of all debris.

#### ***A-2 Required Operating Procedure***

Objective: Minimize impacts on the environment from non-hazardous and hazardous waste generation. Encourage continuous environmental improvement. Protect the health and safety of oil field workers and the general public. Avoid human-caused changes in predator populations.

Requirement/Standard: Lessees/permittees shall prepare and implement a comprehensive waste management plan for all phases of exploration and development, including seismic activities. The plan shall be submitted to the AO for approval, in consultation with Federal, state, and NSB regulatory and resource agencies, as appropriate (based on agency legal authority and jurisdictional responsibility), as part of a plan of operations or other similar permit application. Management decisions affecting waste generation shall be addressed in the following order of priority: 1) Prevention and reduction, 2) recycling, 3) treatment, and 4) disposal. The plan shall consider and take into account the following requirements:

- a) Methods to avoid attracting wildlife to food and garbage. All feasible precautions shall be taken to avoid attracting wildlife to food and garbage. (A list of approved precautions, specific to the type of permitted use, can be obtained from the AO.)
- b) Disposal of putrescible waste. Requirements prohibit the burial of garbage. Lessees and permitted users shall have a written procedure to ensure that the handling and disposal of putrescible waste will be accomplished in a manner that prevents the attraction of wildlife. All putrescible waste shall be incinerated, backhauled, or composted in a manner approved by the AO. All solid waste, including incinerator ash, shall be disposed of in an approved waste-disposal facility in accordance with USEPA and ADEC regulations and procedures. The burial of human waste is prohibited except as authorized by the AO.
- c) Disposal of pumpable waste products. Except as specifically provided, the BLM requires that all pumpable solid, liquid, and sludge waste be disposed of by injection in accordance with USEPA, ADEC, and the Alaska Oil and Gas Conservation Commission regulations and procedures. On-pad temporary muds and cuttings storage, as approved by ADEC, will be allowed as necessary to facilitate annular injection and/or backhaul operations.
- d) Disposal of wastewater and domestic wastewater. The BLM prohibits wastewater discharges or disposal of domestic wastewater into bodies of fresh, estuarine, and marine water, including wetlands, unless authorized by a NPDES or state permit.

#### ***A-3 Required Operating Procedure***

Objective: Minimize pollution through effective hazardous-materials contingency planning.

Requirement/Standard: For oil- and gas-related activities, a Hazardous Materials Emergency Contingency Plan shall be prepared and implemented before transportation, storage, or use of fuel or hazardous substances. The plan shall include a set of procedures to ensure prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of a release. Procedures applicable to fuel and hazardous substances handling (associated with transportation vehicles) shall consist of Best Management Practices (BMPs) if approved by the AO. The plan shall include a list of resources available for response (e.g., heavy-equipment



operators, spill-cleanup materials or companies), and names and phone numbers of Federal, state, and NSB contacts. Other Federal and state regulations may apply and require additional planning requirements. All appropriate staff shall be instructed regarding these procedures.

In addition contingency plans related to facilities developed for oil production shall include requirements to:

- a) provide refresher spill-response training to NSB and local community spill-response teams on a yearly basis,
- b) plan and conduct a major spill-response field-deployment drill annually,
- c) prior to production and as required by law, develop spill prevention and response contingency plans and participate in development and maintenance of the North Slope Subarea Contingency Plan for Oil and Hazardous Substances Discharges/Releases for the National Petroleum Reserve - Alaska operating area. Planning shall include development and funding of detailed (e.g., 1:26,000 scale) environmental sensitivity index maps for the lessee's operating area and areas outside the lessee's operating area that could be affected by their activities. (The specific area to be mapped shall be defined in the lease agreement and approved by the AO in consultation with appropriate resource agencies). Maps shall be completed in paper copy and geographic information system format in conformance with the latest version of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's Environmental Sensitivity Index Guidelines. Draft and final products shall be peer reviewed and approved by the AO in consultation with appropriate Federal, state, and NSB resource and regulatory agencies.

#### ***A-4 Required Operating Procedure***

**Objective:** Minimize the impact of contaminants on fish, wildlife, and the environment, including wetlands, marshes and marine waters, as a result of fuel, crude oil, and other liquid chemical spills. Protect subsistence resources and subsistence activities. Protect public health and safety.

**Requirement/Standard:** Before initiating any oil and gas or related activity or operation, including field research/surveys and/or seismic operations, lessees/permittees shall develop a comprehensive spill prevention and response contingency plan per 40 CFR § 112 (Oil Pollution Act). The plan shall consider and take into account the following requirements:

- a) **On-site Clean-up Materials.** Sufficient oil-spill-cleanup materials (absorbents, containment devices, etc...) shall be stored at all fueling points and vehicle-maintenance areas and shall be carried by field crews on all overland moves, seismic work trains, and similar overland moves by heavy equipment.
- b) **Storage Containers.** Fuel and other petroleum products and other liquid chemicals shall be stored in proper containers at approved locations. Except during overland moves and seismic operations, fuel, other petroleum products, and other liquid chemicals designated by the AO that in total exceed 1,320 gallons shall be stored within an impermeable lined and diked area or within approved alternate storage containers, such as over packs, capable of containing 110% of the stored volume. In areas within 500 feet of water bodies, fuel containers are to be stored within appropriate containment.
- c) **Liner Materials.** Liner material shall be compatible with the stored product and capable of remaining impermeable during typical weather extremes expected throughout the storage period.
- d) **Permanent Fueling Stations.** Permanent fueling stations shall be lined or have impermeable protection to prevent fuel migration to the environment from overfills and spills.
- e) **Proper Identification of Containers.** All fuel containers, including barrels and propane tanks, shall be marked with the responsible party's name, product type, and year filled or purchased.



f) Notice of Reportable Spills. Notice of any reportable spill (as required by 40 CFR § 300.125 and 18 AAC § 75.300) shall be given to the AO as soon as possible, but no later than 24 hours after occurrence.

g) Identification of Oil Pans ("duck ponds"). All oil pans shall be marked with the responsible party's name.

#### ***A-5 Required Operating Procedure***

Objective: Minimize the impact of contaminants from refueling operations on fish, wildlife and the environment.

Requirement/Standard: Refueling of equipment within 500 feet of the active floodplain of any water body is prohibited. Fuel storage stations shall be located at least 500 feet from any water body with the exception of small caches (up to 210 gallons) for motor boats, float planes, ski planes, and small equipment, e.g. portable generators and water pumps, will be permitted. The AO may allow storage and operations at areas closer than the stated distances if properly designed to account for local hydrologic conditions.

#### ***A-6 Required Operating Procedure***

Objective: Minimize the impact on fish, wildlife, and the environment from contaminants associated with the exploratory drilling process.

Requirement/Standard: Surface discharge of reserve-pit fluids is prohibited.

#### ***A-7 Required Operating Procedure***

Objective: Minimize the impacts to the environment of disposal of produced fluids recovered during the development phase on fish, wildlife, and the environment.

Requirement/Standard: Discharge of produced water in upland areas and marine waters is prohibited.

#### ***A-8 Required Operating Procedure***

Objective: Minimize conflicts resulting from interaction between humans and bears during leasing and associated activities.

Requirement: Oil and gas lessees and their contractors and subcontractors will, as a part of preparation of lease operation planning, prepare and implement bear-interaction plans to minimize conflicts between bears and humans. These plans shall include measures to:

- a) Minimize attraction of bears to the drill sites.
- b) Organize layout of buildings and work areas to minimize human/bear interactions.
- c) Warn personnel of bears near or on drill sites and identify proper procedures to be followed.
- d) Establish procedures, if authorized, to discourage bears from approaching the drill site.
- e) Provide contingencies in the event bears do not leave the site or cannot be discouraged by authorized personnel.
- f) Discuss proper storage and disposal of materials that may be toxic to bears.
- g) Provide a systematic record of bears on the site and in the immediate area.
- h) Encourage lessee/permittee to participate and comply with the Incidental Take Program under the Marine Mammal Protection Act.

### **Water Use for Permitted Activities:**

#### ***B-1 Required Operating Procedure***

Objective: Maintain populations of, and adequate habitat for, fish and invertebrates.

Requirement/Standard: Water withdrawal from rivers and streams during winter is prohibited.



**B-2 Required Operating Procedure**

**Objective:** Maintain natural hydrologic regimes in soils surrounding lakes and ponds, and maintain populations of, and adequate habitat for, fish and invertebrates, and waterfowl.

**Requirement/Standard:** Water withdrawal from lakes may be authorized on a site-specific basis depending on water volume, and depth, and fish population and species diversification. Current water withdrawal requirements specify:

- a) Lakes that are  $\geq 7$  feet with sensitive fish (any fish except ninespine stickleback or Alaska blackfish), water available for withdrawal is limited to 15% of calculated volume deeper than 7 feet; lakes that are between 5 and 7 feet with sensitive fish, water available for withdrawal would be calculated on a case by case basis.
- b) Lakes that are  $\geq 5$  feet with only non-sensitive fish (i.e., ninespine stickleback or Alaska blackfish), water available for withdrawal is limited to 30% of calculated volume deeper than 5 feet.
- c) Any lake with no fish present, regardless of depth, water available for withdrawal is up to 35% as specified within the permit.
- d) A water-monitoring plan may be required to assess draw down and water quality changes before, during, and after pumping any fish-bearing lake or lake of special concern.
- e) The removal of naturally grounded ice may be authorized from lakes and shallow rivers on a site-specific basis depending upon its size, water volume, and depth, and fish population and species diversification.
- f) Removed ice aggregate shall be included in the 15% or 30% withdrawal limits—whichever is the appropriate case—unless otherwise approved.
- g) Any water intake structures in fish bearing or non-fish bearing waters shall be designed, operated, and maintained to prevent fish entrapment, entrainment, or injury. Note: All water withdrawal equipment must be equipped and must utilize fish screening devices approved by the Alaska Department of Natural Resources (ADNR).
- h) Compaction of snow cover or snow removal from fish-bearing water bodies shall be prohibited except at approved ice road crossings, water pumping stations on lakes, or areas of grounded ice.

The following lease stipulations and ROPs apply to overland moves, seismic work, and any similar cross-country vehicle use of heavy equipment on non-roaded surfaces during the winter season. These restrictions do not apply to the use of such equipment on ice roads after they are constructed.

**Winter Overland Moves and Seismic Work:****C-1 Required Operating Procedure**

**Objective:** Protect grizzly bear, polar bear, and marine mammal denning and/or birthing locations.

**Requirement/Standard:**

- a) Cross-country use of heavy equipment and seismic activities is prohibited within  $\frac{1}{2}$  mile of occupied grizzly bear dens identified by the ADFG unless alternative protective measures are approved by the AO in consultation with the ADFG.
- b) Cross-country use of heavy equipment and seismic activities is prohibited within 1 mile of known or observed polar bear dens or seal birthing lairs. Operators shall consult with the USFWS and/or NOAA Fisheries, as appropriate, before initiating activities in coastal habitat between October 30 and April 15.



### ***C-2 Required Operating Procedure***

**Objective:** Protect stream banks, minimize compaction of soils, and minimize the breakage, abrasion, compaction, or displacement of vegetation.

**Requirement/Standard:**

- a) Ground operations shall be allowed only when frost and snow cover are at sufficient depths to protect the tundra. Ground operations shall cease when the spring snowmelt begins (approximately May 5 in the foothills area where elevations reach or exceed 500 feet and approximately May 15 in the northern coastal areas). The exact dates will be determined by the AO.
- b) Only low-ground-pressure vehicles shall be used for on-the-ground activities off ice roads or pads. A list of approved vehicles can be obtained from the AO. Limited use of tractors equipped with wide tracks or "shoes" will be allowed to pull trailers, sleighs or other equipment with approved undercarriage. Note: This provision does not include the use of heavy equipment such as front-end loaders and similar equipment required during ice road construction.
- c) Bulldozing of tundra mat and vegetation, trails, or seismic lines is prohibited; however, on existing trails, seismic lines or camps, clearing of drifted snow is allowed to the extent that the tundra mat is not disturbed.
- d) To reduce the possibility of ruts, vehicles shall avoid using the same trails for multiple trips unless necessitated by serious safety or superseding environmental concern. This provision does not apply to hardened snow trails for use by low-ground-pressure vehicles such as Rolligons.
- e) The location of winter ice roads shall be designed and located to minimize compaction of soils and the breakage, abrasion, compaction, or displacement of vegetation. Offsets may be required to avoid using the same route or track in the subsequent year.
- f.) Motorized ground-vehicle use within the CRSA associated with overland moves, seismic work, and any similar use of heavy equipment shall be minimized within the Colville River Raptor, Passerine, and Moose Area from April 15 through August 5, with the exception that use will be minimized in the vicinity of gyrfalcon nests beginning March 15. Such use will remain ½ mile away from known raptor nesting sites, unless authorized by the AO.

### ***C-3 Required Operating Procedure***

**Objective:** Maintain natural spring runoff patterns and fish passage, avoid flooding, prevent streambed sedimentation and scour, protect water quality and protect stream banks.

**Requirement/Standard:** Crossing of waterway courses shall be made using a low-angle approach. Snow and ice bridges shall be removed, breached, or slotted before spring breakup. Ramps and bridges shall be substantially free of soil and debris. Except at approved crossings, operators are encouraged to travel a minimum of 100 feet from known overwintering fish streams and lakes.

### ***C-4 Required Operating Procedure***

**Objective:** Avoid additional freeze-down of deep-water pools harboring over-wintering fish and invertebrates used by fish.

**Requirement/Standard:** Travel up and down streambeds is prohibited unless it can be demonstrated that there will be no additional impacts from such travel to over-wintering fish or the invertebrates they rely on. Rivers and streams shall be crossed at shallow riffles from point bar to point bar whenever possible.



**Oil and Gas Exploratory Drilling:*****D-1 Lease Stipulation***

Objectives: Protect fish-bearing rivers, streams, and lakes from blowouts and minimize alteration of riparian habitat.

Requirement/Standard: Exploratory drilling is prohibited in rivers and streams, as determined by the active floodplain, and fish-bearing lakes.

***D-2 Lease Stipulation***

Objective: Minimize surface impacts from exploratory drilling.

Requirement/Standard: Construction of permanent or gravel oil and gas facilities shall be prohibited for exploratory drilling. Use of a previously constructed road or pad may be permitted if it is environmentally preferred.

**Facility Design and Construction:*****E-1 Required Operating Procedure***

Objective: Protect subsistence use and access to traditional subsistence hunting and fishing areas and minimize the impact of oil and gas activities on air, land, water, fish and wildlife resources.

Requirement/Standard: All roads must be designed, constructed, maintained, and operated to create minimal environmental impacts and to protect subsistence use and access to traditional subsistence hunting and fishing areas. The AO will consult with appropriate Federal, state, and NSB regulatory and resources agencies prior to approving construction of roads. Subject to approval by the AO, the construction, operation and maintenance of oil field roads is the responsibility of the lessee unless the construction, operation, and maintenance of roads are assumed by the appropriate governing entity.

***E-2 Lease Stipulation***

Objective: Protect fish-bearing water bodies, water quality, and aquatic habitats.

Requirement/Standard: Permanent oil and gas facilities, including roads, airstrips, and pipelines, are prohibited upon or within 500 feet as measured from the ordinary high water mark. Essential pipeline and road crossings will be permitted on a case-by-case basis. Note: Also refer to Area-Specific Stipulations and ROPs for Rivers Area (*Lease Stipulation K-1*) and Deep Water Lakes (*Lease Stipulation K-2*).

Construction camps are prohibited on frozen lakes and river ice. Siting of construction camps on river sand and gravel bars is allowed and, where feasible, encouraged. Where leveling of trailers or modules is required and the surface has a vegetative mat, leveling shall be accomplished through blocking rather than use of a bulldozer.

***E-3 Lease Stipulation***

Objective: Maintain free passage of marine and anadromous fish and protect subsistence use and access to traditional subsistence hunting and fishing.

Requirement/Standard: Causeways and docks are prohibited in river mouths or deltas. Artificial gravel islands and bottom-founded structures are prohibited in river mouths or active stream channels on river deltas. Causeways, docks, artificial islands, and bottom-founded drilling structures shall be designed to ensure free passage of marine and anadromous fish and to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics. A monitoring program, developed in consultation with appropriate Federal,



state, and NSB regulatory and resource agencies, shall be required to address the objectives of water quality and free passage of fish.

#### ***E-4 Required Operating Procedure***

Objective: Minimize the potential for pipeline leaks, the resulting environmental damage and industrial accidents.

Requirement/Standard: All pipelines shall be designed, constructed, and operated under an AO-approved Quality Assurance/Quality Control plan that is specific to the product transported and shall be constructed to accommodate the best available technology for detecting and preventing corrosion or mechanical defects during routine structural integrity inspections.

#### ***E-5 Required Operating Procedure***

Objective: Minimize impacts of the development footprint.

Requirement/Standard: Facilities shall be designed and located to minimize the development footprint to the maximum extent practicable considering environmental, economic, safety, and social impacts. Issues and methods that are to be considered include: a) use of maximum feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads; b) sharing facilities with existing development when prudent and technically feasible; c) collocation of all oil and gas facilities, except airstrips, docks, and seawater-treatment plants, with drill pads; d) integration of airstrips with roads; e) use of gravel-reduction technologies, e.g., insulated or pile-supported pads. Note: Where aircraft traffic is a concern, consideration shall be given to balancing gravel pad size and available supply storage capacity with potential reductions in the use of aircraft to support oil and gas operations.

#### ***E-6 Required Operating Procedure***

Objective: Reduce the potential for ice-jam flooding, impacts to wetlands and floodplains, erosion, alteration of natural drainage patterns, and restriction of fish passage.

Requirement/Standard: Stream and marsh crossings shall be designed and constructed to ensure free passage of fish, reduce erosion, maintain natural drainage, and minimize adverse effects to natural stream flow. Note: Bridges, rather than culverts, are the preferred method for crossing rivers. When necessary, culverts can be constructed on smaller streams, if they are large enough to avoid restricting fish passage or adversely affecting natural stream flow.

#### ***E-7 Required Operating Procedure***

Objective: Minimize disruption of caribou movement and subsistence use.

Requirement/Standard: Pipelines and roads shall be designed to allow the free movement of caribou and the safe, unimpeded passage of the public while participating in traditional subsistence activities. Listed below are the accepted design practices:

- a. Above ground pipelines shall be elevated a minimum of 7 feet as measured from the ground to the bottom of the pipeline at vertical support members.
- b. In areas where facilities or terrain may funnel caribou movement, ramps over pipelines, buried pipelines, or pipelines buried under roads may be required by the AO after consultation with Federal, state, and NSB regulatory and resource agencies (as appropriate, based on agency legal authority and jurisdictional responsibility).
- c. A minimum distance of 500 feet between pipelines and roads shall be maintained. Separating roads from pipelines may not be feasible within narrow land corridors between lakes and where pipelines and roads converge on a drill pad. Where it is not feasible to separate pipelines and roads, alternative pipeline routes, designs and possible burial within the road will be considered by the AO.



### ***E-8 Required Operating Procedure***

**Objective:** Minimize the impact of mineral materials mining activities on air, land, water, fish, and wildlife resources.

**Requirement/Standard:** Gravel mine site design and reclamation will be in accordance with a plan approved by the AO. The plan shall be developed in consultation with appropriate Federal, state, and NSB regulatory and resource agencies and consider:

- a. Locations outside the active flood plain.
- b. Design and construction of gravel mine sites within active flood plains to serve as water reservoirs for future use.
- c. Potential use of the site for enhancing fish and wildlife habitat.

### ***E-9 Required Operating Procedure***

**Objective:** Avoidance of human-caused increases in populations of predators of ground nesting birds.

**Requirement/Standard:**

- a. Lessee shall utilize best available technology to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes. The lessee shall provide the AO with an annual report on the use of oil and gas facilities by ravens, raptors and foxes as nesting, denning, and shelter sites.
- b. Feeding of wildlife is prohibited and will be subject to non-compliance regulations.

### ***E-10 Required Operating Procedure***

**Objective:** Prevention of migrating waterfowl, including species listed under the Endangered Species Act, from striking oil and gas and related facilities during low light conditions.

**Requirement/Standard:** Except for safety lighting, illumination of higher structures shall be designed to direct artificial exterior lighting inward and downward, rather than upward and outward. All drilling structures, production facilities, and other structures that exceed 20 feet in height shall be illuminated as outlined above.

### ***E-11 Required Operating Procedure***

**Objective:** Minimize the take of species listed under the Endangered Species Act and minimize the disturbance of other species of interest from direct or indirect interaction with oil and gas facilities.

**Requirement/Standard:** In accordance with the guidance below, before the approval of facility construction, aerial surveys of the following species shall be conducted within any area proposed for development.

#### **Special Conditions in Spectacled and/or Steller's Eiders Habitats:**

- a. Surveys shall be conducted by the lessee for at least 3 years before authorization of construction, if such construction is within the USFWS North Slope eider survey area and at least 1 year outside that area. Results of aerial surveys and habitat mapping may require additional ground nest surveys. Spectacled and/or Steller's eider surveys shall be conducted following accepted BLM-protocol during the second week of June.
- b. If spectacled and/or Steller's eiders are determined to be present within the proposed development area, the applicant shall consult with the USFWS and BLM in the design and placement of roads and facilities in order to minimize impacts to nesting and brood-rearing eiders and their preferred habitats. Such consultation shall address timing restrictions and other temporary mitigating measures, construction of permanent facilities, placement of fill, alteration of eider habitat, aircraft operations, and introduction of high noise levels.
- c. To reduce the possibility of spectacled and/or Steller's eiders striking above ground utility lines (power and communication), such lines shall either be buried in access roads, or suspended on vertical support members, to the extent practicable. Support wires associated



with communication towers, radio antennas, and other similar facilities, shall be clearly marked along their entire length to improve visibility for low flying birds. Such markings shall be jointly developed through consultation with the USFWS. Overhead power and/or communication lines for oil and gas activities will be limited to the following circumstances.

1. Overhead power or communication lines may be allowed when located entirely within the boundaries of a facility pad;
2. Overhead power or communication lines may be allowed when engineering constraints at the specific location make it unfeasible to bury or connect them to a vertical support member, or
3. Overhead power or communication lines may be allowed when human safety would be compromised by other methods. (Note: Unlike the case with the first two circumstances listed immediately above, this circumstance may justify overhead power or communications lines over a larger portion of the Planning Area).

**Special Conditions in Yellow-billed Loon Habitats:**

- a. Aerial surveys shall be conducted by the lessee for at least 3 years before authorization of construction of facilities proposed for development which are within 1 mile of a lake 25 acres or larger in size. These surveys along shorelines of large lakes shall be conducted following accepted BLM protocol during nesting in late June and during brood rearing in late August.
- b. Should yellow-billed loons be present, the design and location of facilities must be such that disturbance is minimized. The default standard mitigation is a 1-mile buffer around all recorded nest sites and a minimum 1,625-foot (500-meter) buffer around the remainder of the shoreline. Development will generally be prohibited within buffers unless no other option exists.

***E-12 Required Operating Procedure***

**Objective:** Use ecological mapping as a tool to assess wildlife habitat before development of permanent facilities, to conserve important habitat types during development.

**Requirement/Standard:** An ecological land classification map of the development area shall be developed before approval of facility construction. The map will integrate geomorphology, surface form, and vegetation at a scale, level of resolution, and level of positional accuracy adequate for detailed analysis of development alternatives. The map shall be prepared in time to plan one season of ground-based wildlife surveys, if deemed necessary by the AO, before approval of the exact facility location and facility construction.

***E-13 Required Operating Procedure***

**Objective:** Protect cultural and paleontological resources.

**Requirement/Standard:** Lessees shall conduct a cultural and paleontological resources survey prior to any ground-disturbing activity. Upon finding any potential cultural or paleontological resource, the lessee or their designated representative shall notify the AO and suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the AO.

**Use of Aircraft for Permitted Activities:**

***F-1 Required Operating Procedure***

**Objective:** Minimize the effects of low-flying aircraft on wildlife, traditional subsistence activities, and local communities.

**Requirement/Standard:** The lessee shall ensure that aircraft used for permitted activities maintain altitudes according to the following guidelines (Note: This ROP is not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated



objective of the stipulations and ROPs. However, flights necessary to gain this information will be restricted to the minimum necessary to collect such data):

- a) Aircraft shall maintain an altitude of at least 1,500 feet above ground level (AGL) when within ½ mile of cliffs identified as raptor nesting sites from April 15 through August 15 and within ½ mile of known gyrfalcon nest sites from March 15 to August 15, unless doing so would endanger human life or violate safe flying practices. Permittees shall obtain information from the BLM necessary to plan flight routes when routes may go near falcon nests.
- b) Aircraft shall maintain an altitude of at least 1,000 feet AGL (except for takeoffs and landings) over caribou winter ranges from December 1 through May 1, unless doing so would endanger human life or violate safe flying practices. Caribou wintering areas will be defined annually by the AO. The AO will consult directly with the Alaska Department of Fish and Game in annually defining caribou winter ranges.
- c) Land user shall submit an aircraft use plan as part of an oil and gas exploration or development proposal. The plan shall address strategies to minimize impacts to subsistence hunting and associated activities, including but not limited to the number of flights, type of aircraft, and flight altitudes and routes, and shall also include a plan to monitor flights. Proposed aircraft use plans should be reviewed by appropriate Federal, State, and Borough agencies. Consultations with these same agencies will be required if unacceptable disturbance is identified by subsistence users. Adjustments, including possible suspension of all flights, may be required by the AO if resulting disturbance is determined to be unacceptable. The number of takeoffs and landings to support oil and gas operations with necessary materials and supplies should be limited to the maximum extent possible. During the design of proposed oil and gas facilities, larger landing strips and storage areas should be considered so as to allow larger aircraft to be employed, resulting in fewer flights to the facility.
- d) Use of aircraft, especially rotary wing aircraft, near known subsistence camps and cabins or during sensitive subsistence hunting periods (spring goose hunting and fall caribou and moose hunting) should be kept to a minimum.
- e) Aircraft used for permitted activities shall maintain an altitude of at least 2,000 feet AGL (except for takeoffs and landings) over the Teshekpuk Lake Caribou Habitat Area (Map 2-4) from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices. Aircraft use (including fixed wing and helicopter) by oil and gas lessees in the Goose Molting Area (Map 2-5) should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.

## **Oil Field Abandonment:**

### ***G-1 Lease Stipulation***

**Objective:** Ensure the final disposition of the land meets the current and future needs of the public.

**Requirement/Standard:** Upon abandonment or expiration of the lease, all oil- and gas-related facilities shall be removed and sites rehabilitated to as near the original condition as practicable, subject to the review of the AO. The AO may determine that it is in the best interest of the public to retain some or all facilities. Within the Goose Molting Area, the AO, when determining if it is in the best interest of the public to retain a facility, will consider the impacts of retention to molting geese and goose molting habitat.



## **Subsistence Consultation for Permitted Activities:**

### ***H-1 Required Operating Procedure***

**Objective:** Provide opportunities for participation in planning and decision making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities.

**Requirement/Standard:** Lessee/permittee shall consult directly with affected communities using the following guidelines:

- a) Before submitting an application to the BLM, the applicant shall consult with directly affected subsistence communities, the NSB, and the National Petroleum Reserve - Alaska Subsistence Advisory Panel to discuss the siting, timing and methods of their proposed operations to help discover local traditional and scientific knowledge, resulting in measures that minimize impacts to subsistence uses. Through this consultation, the applicant shall make every reasonable effort, including such mechanisms as conflict avoidance agreements and mitigating measures, to ensure that proposed activities will not result in unreasonable interference with subsistence activities.
- b) The applicant shall submit documentation of consultation efforts as part of its operations plan. Applicants should submit the proposed plan of operations to provide an adequate time for review and comment by the National Petroleum Reserve - Alaska Subsistence Advisory Panel and to allow time for formal Government-to-Government consultation with Native Tribal governments. The applicant shall submit documentation of its consultation efforts and a written plan that shows how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence activities. Operations plans must include a discussion of the potential effects of the proposed operation, and the proposed operation in combination with other existing or reasonably foreseeable operations.
- c) A subsistence plan addressing the following items must be submitted:
  1. A detailed description of the activity(ies) to take place (including the use of aircraft).
  2. A description of how the lessee/permittee will minimize and/or deal with any potential impacts identified by the AO during the consultation process.
  3. A detailed description of the monitoring effort to take place, including process, procedures, personnel involved and points of contact both at the work site and in the local community.
  4. Communication elements to provide information on how the applicant will keep potentially affected individuals and communities up-to-date on the progress of the activities and locations of possible, short-term conflicts (if any) with subsistence activities. Communication methods could include holding community meetings, open house meetings, workshops, newsletters, radio and television announcements, etc.
  5. Procedures necessary to facilitate access by subsistence users to conduct their activities.

In the event that no agreement is reached between the parties, the AO shall consult with the directly involved parties and determine which activities will occur, including the timeframes. During development, monitoring plans must be established for new permanent facilities, including pipelines, to assess an appropriate range of potential effects on resources and subsistence as determined on a case-by-case basis given the nature and location of the facilities. The scope, intensity, and duration of such plans will be established in consultation with the AO and Subsistence Advisory Panel.

Permittees that propose barging facilities, equipment, supplies, or other materials to NPR-A in support of oil and gas activities in the planning area shall notify, confer, and coordinate with the Alaska Eskimo Whaling Commission, the appropriate local community whaling captains' associations, and the NSB to minimize impacts from the proposed barging on subsistence whaling activities.



***H-2 Required Operating Procedure***

**Objective:** Prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration.

**Requirement/Standard:** In addition to the consultation process described in ROP H-1 for permitted activities, before applying for permits to conduct geophysical (seismic) exploration, the applicant shall 1) consult with local communities and residents and 2) notify the local Search and Rescue organizations of current and recent seismic surveys. For the purpose of this standard, a potentially affected cabin/campsite is defined as any camp or campsite within the boundary of the area subject to proposed geophysical exploration and/or within 1 mile of actual or planned travel routes used to supply the seismic operations while it is in operation.

- Because of the large land area covered by typical geophysical operations and the potential to impact a large number of subsistence users during the exploration season, the permittee/operator will notify in writing all potentially affected long-term cabin and camp users.
- The official recognized list of cabin and campsite users is the NSB's 2001 (or most current) inventory of cabins and campsites.
- A copy of the notification letter and a list of potentially affected users shall also be provided to the office of the appropriate Native Tribal government.
- The AO will prohibit seismic work within 1 mile of any known, long-term, cabin or campsite unless an alternate agreement between the cabin/campsite owner/user is reached through the consultation process and presented to the AO. (Regardless of the consultation outcome, the AO will prohibit wintertime seismic work within 300 feet of a known long-term cabin or campsite.)
- The permittee shall notify the appropriate local Search and Rescue (e.g., Nuiqsut Search and Rescue, Atqasuk Search and Rescue) of their current operational location within the NPR-A on a weekly basis. This notification should include a map indicating the current extent of surface use and occupation, as well as areas previously used/occupied during the course of the operation in progress. The purpose of this notification is to allow hunters up-to-date information regarding where seismic exploration is occurring, and has occurred, so that they can plan their hunting trips and access routes accordingly. Identification of the appropriate Search and Rescue offices to be contacted can be obtained from the NPR-A Subsistence Advisory Panel.

**Orientation Programs Associated with Permitted Activities:*****I-1 Required Operating Procedure***

**Objective:** Minimize cultural and resource conflicts.

**Requirement/Standard:** All personnel involved in oil and gas and related activities shall be provided information concerning applicable stipulations, ROPs, standards, and specific types of environmental, social, traditional, and cultural concerns that relate to the region. The lessee/permittee shall ensure that all personnel involved in permitted activities shall attend an orientation program at least once a year. The proposed orientation program shall be submitted to the AO for review and approval and should:

- a. provide sufficient detail to notify personnel of applicable stipulations and ROPs as well as inform individuals working on the project of specific types of environmental, social, traditional and cultural concerns that relate to the region.
- b. Address the importance of not disturbing archaeological and biological resources and habitats, including endangered species, fisheries, bird colonies, and marine mammals, and provide guidance on how to avoid disturbance.



- c. Include guidance on the preparation, production, and distribution of information cards on endangered and/or threatened species.
- d. Be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which personnel will be operating.
- e. Include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation.
- f. Include information for aircraft personnel concerning subsistence activities and areas/seasons that are particularly sensitive to disturbance by low-flying aircraft. Of special concern is aircraft use near traditional subsistence cabins and campsites, flights during spring goose hunting and fall caribou and moose hunting seasons, and flights near North Slope communities.
- g. Provide that individual training is transferable from one facility to another except for elements of the training specific to a particular site.
- h. Include on-site records of all personnel who attend the program for so long as the site is active, though not to exceed the 5 most recent years of operations. This record shall include the name and dates(s) of attendance of each attendee.
- i. Include a module discussing bear interaction plans to minimize conflicts between bears and humans.
- j. Provide a copy of 43 CFR 3163 regarding Non-Compliance Assessment and Penalties to on-site personnel.

#### **Endangered Species Act—Section 7 Consultation Process:**

**J.** The lease areas may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or to have some other special status. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activities that will contribute to the need to list such a species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.

#### **Lease Stipulations that Apply in Biologically Sensitive Areas:**

##### ***K-1 Lease Stipulation - Rivers***

**Objective:** Minimize the disruption of natural flow patterns and changes to water quality; the disruption of natural functions resulting from the loss or change to vegetative and physical characteristics of floodplain and riparian areas; the loss of spawning, rearing or over-wintering habitat for fish; the loss of cultural and paleontological resources; the loss of raptor habitat; impacts to subsistence cabin and campsites; the disruption of subsistence activities; and impacts to scenic and other resource values.

**Requirement/Standard:** Permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines, are prohibited in the streambed and adjacent to the rivers listed below at the distances identified. (Gravel mines may be located within the active flood plain consistent with ROP E-8). With the exception of the Ikpihpuk River, these setbacks are measured from the bank of the river as determined by the hydrology at the time of application. The standard



setback is ½ mile (from the bank's highest high water mark) and increased to ¾ mile (from the bank's highest high water mark) where subsistence cabin and campsites are numerous. Along the Colville River and a portion of the Ikpihpuk a 1-mile (from the bank's highest high water mark) setback is required to protect important raptor habitat (for locations along rivers where setback distances change). On a case-by case basis, and in consultation with Federal, state, and NSB regulatory and resource agencies (as appropriate, based on agency legal authority and jurisdictional responsibility), essential pipeline and road crossings to the main channel will be permitted through setback areas. The above setbacks may not be practical within river deltas. In these situations, permanent facilities shall be designed to withstand a 200-year flood event.

a) **Colville River:** a 1-mile setback from the boundary of NPR-A along the Colville River as determined by cadastral survey to be the highest high watermark on the left (western or northern) bank extending the length of that portion of the river located within the Planning Area. Note: The Planning Area excludes conveyed Native lands along the lower reaches of the Colville River. Development of road crossings intended to support oil and gas activities shall be consolidated with other similar projects and uses to the maximum extent possible. Note: This provision does not apply to intercommunity or other permanent roads constructed with public funds for general transportation purposes. This preserves the opportunity to plan, design, and construct public transportation systems to meet the economic, transportation, and public health and safety needs of the State of Alaska and/or communities within National Petroleum Reserve - Alaska.

b) **Ikpihpuk River:** a ¾-mile setback from each side of the centerline (1½ miles total) of the Ikpihpuk River extending from the mouth south to Sec. 19, T. 7 N., R. 11 W., U.M. (Umiat Meridian). From Sec. 19, T. 7 N., R. 11 W., U.M., to Sec. 4, T. 3 N., R. 12 W., U.M., a 1-mile setback is required. Beginning at Sec. 4, T. 3 N., R. 12 W., U.M., a ½-mile setback from the centerline (1 mile total) will be required to the confluence of the Kigalik River and Maybe Creek. Note: The setback distances only apply to the east bank where the Ikpihpuk River is the Planning Area boundary.

c) **Miguakiak River:** a ½-mile setback from the bank's highest high water mark.

d) **Kikiakrorak and Kogosukruk Rivers:** Note: The following discussion refers only to portions of the Kikiakrorak River downstream from T. 2 N., R. 4 W., U.M. and the Kogosukruk River (including the four tributaries off the southern bank) downstream from T. 2 N., R. 3 W., U.M.. No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within 1 mile of the top of the bluff (or bank if there is no bluff) on either side of the rivers and several of the Kogosukruk tributaries.

e) **Fish Creek:** No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within 3 miles (from the bank's highest high water mark) of the creek downstream from the eastern edge of Sec. 31, T. 11 N., R. 1 E., U.M. or within ½ mile (from the bank's highest high water mark) of the creek farther upstream.

f) **Judy Creek:** a ½-mile setback from the banks' highest high water mark extending from the mouth to the confluence of an unnamed tributary in Sec. 8, T8N., R.2W., Umiat Meridian.

g) **Tingmiaksiqvik River:** No permanent oil and gas surface facilities, except essential transportation crossings, would be allowed within ½ mile (from the bank's highest high water mark) of this river from its headwaters within Sec. 13, T. 7 N., R. 1 W., U.M. downstream to its confluence with Fish Creek.

### ***K-2 Lease Stipulation--Deep Water Lakes***

Objective: Minimize the disruption of natural flow patterns and changes to water quality; the disruption of natural functions resulting from the loss or change to vegetative and physical characteristics of deep water lakes; the loss of spawning, rearing or over wintering habitat for fish; the loss of cultural and paleontological resources; impacts to subsistence cabin and campsites; and the disruption of subsistence activities.



**Requirement/Standard:** Generally, permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines, are prohibited on the lake or lakebed and within ¼ mile of the ordinary high water mark of any deep lake as determined to be in lake zone III (i.e., depth greater than 13 feet [4 meters]; Mellor 1985). On a case-by-case basis in consultation with Federal, State and NSB regulatory and resource agencies (as appropriate based on agency legal authority and jurisdictional responsibility), essential pipeline(s), road crossings, and other permanent facilities may be considered through the permitting process in these areas where the lessee can demonstrate on a site-specific basis that impacts will be minimal and if it is determined that there is no feasible or prudent alternative.

### ***K-3 Stipulation - Teshekpuk Lake Shoreline***

(Note: Teshekpuk Lake and islands within the lake (approximately 219,000 acres) will not be available for oil and gas leasing.)

**Objective:** Minimize the disruption of natural flow patterns and changes to water quality; the disruption of natural functions resulting from the loss or change to vegetative and physical characteristics of this large and regionally significant deep water lake; the loss of cultural and paleontological resources; impacts to subsistence cabins, campsites and associated activities; and to protect fish and wildlife habitat including important insect relief areas.

**Requirement/Standard:** Permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines, are prohibited within ¼ mile of the ordinary high water mark of Teshekpuk Lake. (No alternative procedures will be approved.)

### ***K-4 Lease Stipulation - Goose Molting Area***

**Objective:** Minimize disturbance to molting geese and loss of goose molting habitat in and around lakes in the Goose Molting Area.

**Requirement/Standard (General):** Within the Goose Molting Area no permanent oil and gas facilities, except for pipelines will be allowed on the approximately 240,000 acres of lake buffers illustrated in lavender on Map 2-5. No alternative procedures will be considered. Prior to the permitting of a pipeline in the Goose Molting Area, a workshop will be convened to determine the best corridor for pipeline construction in efforts to minimize impacts to wildlife and subsistence resources. The workshop participants will include but will not be limited to Federal, State, and NSB representatives. In addition, only "In Field" roads will be authorized as part of oil and gas field development.

**Requirement/Standard (Exploration):** In goose molting habitat area exploratory drilling shall be limited to temporary facilities such as ice pads, ice roads, and ice airstrips, unless the lessee demonstrates that construction of permanent facilities (outside the identified Goose Molting Restricted Surface Occupancy Areas) such as gravel airstrips, storage pads, and connecting roads is environmentally preferable (Also see *Stipulation K-11* regarding allowable surface disturbance). In addition, the following standards will be followed for permitted activities:

- a) From June 15 through August 20 exploratory drilling and associated activities are prohibited. The intent of this rule is to restrict exploration drilling during the period when geese are present.
- b) Water extraction from any lake used by molting geese shall not alter hydrological conditions that could adversely affect identified goose-feeding habitat along lakeshore margins. Considerations will be given to seasonal use by operators (generally in winter) and geese (generally in summer), as well as recharge to lakes from the spring snowmelt.
- c) Oil and gas exploration activities will avoid alteration (e.g., damage or disturbance of soils, vegetation, or surface hydrology) of critical goose-feeding habitat types along lakeshore margins (grass/sedge/moss), as identified by the AO in consultation with the USFWS.

**Requirement/Standard (Development):** In Goose Molting Area, the following standards will be followed for permitted activities:



- a) Within the Goose Molting Area from June 15 through August 20, all off-pad activities and major construction activities using heavy equipment (e.g., sand/gravel extraction and transport, pipeline and pad construction, but not drilling from existing production pads) shall be suspended (see also Lease Stipulation K-5-d), unless approved by the AO in consultation with the appropriate Federal, State, and NSB regulatory and resource agencies. The intent of this requirement is to restrict activities that will disturb molting geese during the period when geese are present.
- b) Water extraction from any lakes used by molting geese shall not alter hydrological conditions that could adversely affect identified goose-feeding habitat along lakeshore margins. Considerations will be given to seasonal use by operators (generally in winter) and geese (generally in summer), as well as recharge to lakes from the spring snowmelt.
- c) Oil and gas activities will avoid altering (i.e., damage or disturbance of soils, vegetation, or surface hydrology) critical goose-feeding habitat types along lakeshore margins (grass/sedge/moss) and salt marsh habitats.
- d) Permanent oil and gas facilities (including gravel roads, pads, and airstrips, but excluding pipelines) and material sites will be sited outside the identified buffers and RSO areas. Additional limits on development footprint apply; (also see Lease Stipulation K-11.)
- e) Between June 15 and August, 20 within the Goose Molting Area, oil and gas facilities shall incorporate features (e.g., temporary fences, siting/orientation) that screen/shield human activity from view of any Goose Molting Area lake, as identified by the AO in consultation with appropriate Federal, State, and NSB regulatory and resource agencies.
- f) Strategies to minimize ground traffic shall be implemented from June 15 through August 20. These strategies may include limiting trips, use of convoys, different vehicle types, etc. to the extent practicable. The lessee shall submit with the development proposal a vehicle use plan that considers these and any other mitigation. The vehicle use plan shall also include a vehicle-use monitoring plan. Adjustments will be required by the AO if resulting disturbance is determined to be unacceptable.
- g) Within the Goose Molting Area aircraft use (including fixed wing and helicopter) shall be restricted from June 15 through August 20 unless doing so endangers human life or violates safe flying practices. Restrictions may include: 1) limiting flights to two round-trips/week, and 2) limiting flights to corridors established by the BLM after discussions with appropriate Federal, State, and NSB regulatory and resource agencies. The lessee shall submit with the development proposal an aircraft use plan that considers these and other mitigation. The aircraft use plan shall also include an aircraft monitoring plan. Adjustments, including perhaps suspension of all aircraft use, will be required by the AO if resulting disturbance is determined to be unacceptable. Note: This site-specific lease stipulation is not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulations and ROPs. However, flights necessary to gain this information will be restricted to the minimum necessary to collect such data.
- h) Any permit for development issued under this IAP/EIS will include a requirement for the lessee to conduct monitoring studies necessary to adequately determine consequences of development and any need for change to mitigations. Monitoring studies will be site- and development-specific within a set of over-arching guidelines developed by the BLM after conferring with appropriate Federal, State, NSB agencies. The study(s) will include the construction period and will continue for a minimum of 3 years after construction has been completed and production has begun. The monitoring studies will be a continuation of evaluating the effectiveness of the K-4 Lease Stipulation requirements in meeting the objective of K-4 and determine if any changes to the lease stipulation or any project specific mitigation(s) are necessary. If changes are determined to be necessary, the BLM, with the lessee and/or their representative, will conduct an assessment of the feasibility of altering development operation (e.g. reduced human activity, visibility barriers, noise abatement). Any



changes determined necessary will be implemented prior to authorization of any new construction.

***K-5 Lease Stipulation - Teshekpuk Lake Caribou Habitat Area***

**Objective:** Minimize disturbance and hindrance of caribou, or alteration of caribou movements through portions the Teshekpuk Lake Caribou Habitat Area that are essential for all season use, including calving and rearing, insect-relief, and migration.

**Requirement/Standard:** In the Teshekpuk Lake Caribou Habitat Area the following standards will be applied to permitted activities:

- a) Before authorization of construction of permanent facilities (limited as they may be by RSO areas established in other lease stipulations), the lessee shall design and implement and report a study of caribou movement unless an acceptable study(s) specific to the Teshekpuk Lake Caribou Herd (TLCH) has been completed within the last 10 years. The study shall include a minimum of four years of current data on the TLCH movements and the study design shall be approved by the AO in consultation with the appropriate Federal, State, and NSB wildlife and resource agencies. The study should provide information necessary to determine facility (including pipeline) design and location. Lessees may submit individual study proposals or they may combine with other lessees in the area to do a single, joint study for the entire TLCHA. Study data may be gathered concurrently with other activities as approved by the AO and in consultation with the appropriate Federal, State, and NSB wildlife and resource agencies. A final report of the study results will be prepared and submitted. Prior to the permitting of a pipeline in the TLCHA, a workshop will be convened to identify the best corridor for pipeline construction in efforts to minimize impacts to wildlife (specifically the TLCH) and subsistence resources. The workshop participants will include but will not be limited to Federal, State, and NSB representatives. All of these modifications will increase protection for caribou and other wildlife that utilize the TLCHA during all seasons.
- b) Within the TLCHA, lessees shall orient linear corridors when laying out oil field developments to the extent practicable, to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities.
- c) Ramps over pipelines, buried pipelines, or pipelines buried under the road may be required by the AO, after consultation with appropriate Federal, State, and NSB regulatory and resource agencies, in the TLCHA where pipelines potentially impede caribou movement.
- d) Major construction activities using heavy equipment (e.g., sand/gravel extraction and transport, pipeline and pad construction, but not drilling from existing production pads) shall be suspended within TLCHA from May 20 through August 20, unless approved by the AO in consultation with the appropriate Federal, State, and NSB regulatory and resource agencies. The intent of this requirement is to restrict activities that will disturb caribou during calving and insect-relief periods. If caribou arrive on the calving grounds prior to May 20, major construction activities will be suspended. The lessee shall submit with the development proposal a "stop work" plan that considers this and any other mitigation related to caribou early arrival. The intent of this latter requirement is to provide flexibility to adapt to changing climate conditions that may occur during the life of fields in the region.
- e) The following ground and air traffic restrictions shall apply to permanent oil and gas-related roads in the areas and time periods indicated:
  1. Within the TLCHA, from May 20 through August 20, traffic speed shall not exceed 15 miles per hour when caribou are within ½ mile of the road. Additional strategies may include limiting trips, using convoys, using different vehicle types, etc., to the extent practicable. The lessee shall submit with the development proposal a vehicle use plan that considers these and any other mitigation. The vehicle use plan shall also include a vehicle-use monitoring plan. Adjustments will be required by the AO if resulting disturbance is determined to be unacceptable.



2. The lessee or a contractor shall observe caribou movement from May 20 through August 20, or earlier if caribou are present prior to May 20. Based on these observations, traffic will be stopped temporarily to allow a crossing by 10 or more caribou. Sections of road will be evacuated whenever an attempted crossing by a large number of caribou appears to be imminent. The lessee shall submit with the development proposal a vehicle use plan that considers these and any other mitigation. The vehicle use plan shall also include a vehicle-use monitoring plan. Adjustments will be required by the AO if resulting disturbance is determined to be unacceptable.
3. Major equipment, materials, and supplies to be used at oil and gas work sites in the TLCHA shall be stockpiled prior to or after the period of May 20 through August 20 to minimize road traffic during that period.
4. Within the TLCHA aircraft use (including fixed wing and helicopter) shall be restricted from May 20 through August 20 unless doing so endangers human life or violates safe flying practices. Restrictions may include prohibiting the use of aircraft larger than a Twin Otter by authorized users of the Planning Area, including oil and gas lessees, from May 20 through August 20 within the TLCHA, except for emergency purposes. The lessee shall submit with the development proposal an aircraft use plan that considers these and other mitigation. The aircraft use plan shall also include an aircraft monitoring plan. Adjustments, including perhaps suspension of all aircraft use, will be required by the AO if resulting disturbance is determined to be unacceptable. This lease stipulation is not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulations and ROPs. However, flights necessary to gain this information will be restricted to the minimum necessary to collect such data.
5. Within the TLCHA aircraft use (including fixed wing and helicopter) shall be restricted from May 20 through June 20 unless doing so endangers human life or violates safe flying practices. Restrictions may include limiting fixed-wing aircraft takeoffs and landings by authorized users of the Planning Area to an average of one round-trip flight per day from May 20 through June 20, at aircraft facilities within the TLCHAs. The lessee shall submit with the development proposal an aircraft use plan that considers these and other mitigation. The aircraft use plan shall also include an aircraft monitoring plan. Adjustments, including perhaps suspension of all aircraft use, will be required by the AO if resulting disturbance is determined to be unacceptable.
6. Aircraft shall maintain a minimum height of 1,000 feet AGL (except for takeoffs and landings) over caribou winter ranges from December 1 through May 1, and 2,000 feet AGL over the TLCHA from May 20 through August 20, unless doing so endangers human life or violates safe flying practices. Caribou wintering ranges will be defined annually by the AO in consultation with the Alaska Department of Fish and Game. This lease stipulation is not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulations and ROPs. However, flights necessary to gain this information will be restricted to the minimum necessary to collect such data.

#### ***K-6 Stipulation - Coastal Area***

**Objective:** Minimize hindrance or alteration of caribou movement within caribou coastal insect-relief areas; to prevent contamination of marine waters; loss of important bird habitat; alteration or disturbance of shoreline marshes; and impacts to subsistence resources activities.

**Requirement/Standard:** In the Coastal Area, permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines established to support exploration and development activities shall be located at least  $\frac{3}{4}$  mile inland from the coastline to the extent practicable. Where, as a result of technological limitations, economics, logistics, or other factors, a facility must be located within  $\frac{3}{4}$  mile inland of the coastline, the practicality of locating the facility at previously occupied sites such as Camp Lonely, various Husky/USGS drill sites, and Distant



Early Warning (DEW)-Line sites, shall be considered. Use of existing sites within  $\frac{3}{4}$  mile of the coastline shall also be acceptable where it is demonstrated that use of such sites will reduce impacts to shorelines or otherwise be environmentally preferable. All lessees/permitees involved in activities in the immediate area must coordinate use of these new or existing sites with all other prospective users. Before conducting open water activities, the lessee shall consult with the Alaska Eskimo Whaling Commission, the Nuiqsut Whaling Captains' Association, and the NSB to minimize impacts to the fall and spring subsistence whaling activities of the communities of the North Slope.

#### ***K-7 Lease Stipulation - Colville River Special Area***

**Objective:** Prevent or minimize loss of raptor foraging habitat. (also see Lease Stipulation K-1; Rivers Area).

**Requirement/Standard for Facilities:** If necessary to construct permanent facilities within the Colville River Special Area, all reasonable and practicable efforts shall be made to locate permanent facilities as far from raptor nests as feasible. Additionally, within 15 miles of raptor nest sites, significant alteration of high quality foraging habitat shall be prohibited unless the lessee can demonstrate on a site-specific basis that impacts would be minimal or it is determined that there is no feasible or prudent alternative. Of particular concern are ponds, lakes, wetlands, and riparian habitats. Note: On a case-by case basis, and in consultation with appropriate Federal and state regulatory and resource agencies, essential pipeline and road crossings will be permitted through these areas where no other feasible or prudent options are available.

**Requirement/Standard for Activities:** Restriction applies to overland moves, seismic work, and any similar use of heavy equipment (other than actual excavations as part of construction) on tundra surfaces.

#### ***K-8 Lease Stipulation - Pik Dunes***

**Objective:** Retain unique qualities of the Pik Dunes, including geologic and scenic uniqueness, insect-relief habitat for caribou, and habitat for several uncommon plant species.

**Requirement/Standard:** Surface structures, except approximately perpendicular pipeline crossings and ice pads, are prohibited within the Pik Dunes.

#### ***K-9 Lease Stipulation - Caribou Movement Corridor***

**Objective:** Minimize disturbance and hindrance of caribou, or alteration of caribou movements (that are essential for all season use, including calving and rearing, insect-relief, and migration) in the area extending from the eastern shore of Teshekpuk Lake to approximately 6 miles eastward towards the Kogru Inlet and 2) the area adjacent to the northwest corner of Teshekpuk Lake.

**Requirement/Standard:** Within the Caribou Movement Corridors, no permanent oil and gas facilities, except for pipelines, will be allowed on the approximately 54,700 (approximately 45,000 acres east of Teshekpuk Lake, and approximately 9,700 acres northwest of Teshekpuk Lake) illustrated on Map 2-4. Prior to the permitting of a pipeline in the Caribou Movement Corridors, a workshop will be convened to identify the best corridor for pipeline construction in efforts to minimize impacts to wildlife and subsistence resources. The workshop participants will include but will not be limited to Federal, State, and NSB representatives. Note: In addition to the general lease stipulations and ROPs, site-specific lease stipulations, i.e. K-3, K-4, K-5, and K-11 will also apply.



***K-10 Lease Stipulation – Southern Caribou Calving Area***

**Objective:** Minimize disturbance and hindrance of caribou, or alteration of caribou movements (that are essential for all season use, including calving and post calving, and insect-relief) in the area south/southeast of Teshekpuk Lake:

**Requirement/Standard:** Within the Southern Caribou Calving Area, no permanent oil and gas facilities, except pipelines, would be allowed on the approximately 240,000 acres illustrated on Map 2-4. Prior to the permitting of a pipeline in the Southern Caribou Calving Area, a workshop will be convened to identify the best corridor for pipeline construction in efforts to minimize impacts to wildlife and subsistence resources. The workshop participants will include but will not be limited to Federal, State, and NSB representatives. Note: In addition to the general stipulations and ROPs, site specific *Stipulations K-4, K-5, K-6, and K-11* would also apply.

***K-11 Lease Stipulation: Lease Tracts A-G***

**Objective:** To protect key surface resources and subsistence resources/activities resulting from permanent oil and gas development and associated activities.

**Requirement Standard:** Permanent surface disturbance resulting from oil and gas activities is limited to 300 acres within the following described lease tracts (Map 2-4); this does not include surface disturbance activities from pipeline construction. Existing gravel pads within these tracts would not count against the 300-acre limit. A pipeline will be considered after a workshop is convened to identify the best corridor for pipeline construction in efforts to minimize impacts to wildlife and subsistence resources. The workshop participants will include but will not be limited to Federal, State, and NSB representatives. (No alternative procedures will be approved). (Acreages are based on GIS calculations and are approximate):

A. Total Acreage: approximately 52,700:

- 26,500 acres = RSO for Permanent Oil and Gas facilities excluding pipelines (the 23,350 acres includes 5,605 acres of overlap with the Coastal area restrictions).
- 26,200 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.6 % of total acreage).

B. Total Acreage: approximately 55,000:

- 38,200 acres = RSO for Permanent Oil and Gas facilities, excluding pipelines (the 33,478 acres includes 5,131 acres of overlap with the Coastal Area restrictions).
- 16,800 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.5 % of total acreage).

C. Total Acreage: approximately 46,100:

- 32,500 acres = RSO for Permanent Oil and Gas facilities, excluding pipelines.
- 13,600 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.7 % of total acreage).

D. Total Acreage: approximately 54,500:

- 46,900 acres = RSO for Permanent Oil and Gas facilities excluding pipelines.
- 7,700 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.6% of total acreage).

E. Total Acreage: approximately 56,500:

- 32,200 acres = RSO for Permanent Oil and Gas facilities, excluding pipelines.
- 24,300 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.5% of total acreage).



F. Total Acreage: approximately 57,100:

- 43,200 acres = RSO for Permanent Oil and Gas facilities, excluding pipelines.
- 4,900 acres = Restricted area open to development subject to the results of 3 year study requirement to determine appropriate placement of permanent facility(s) (Map 2-5 )
- 9,000 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.5 % of total acreage).

G. Total Acreage: approximately 56,800:

- 48,700 acres = RSO for Permanent Oil and Gas facilities excluding pipelines
- 300 acres = Restricted area open to development subject to the results of 3 year study requirement to determine appropriate placement of permanent facility(s) (Map 2-5)
- 7,800 acres = Area open to development subject to general and site specific lease stipulations and required operating procedures.

The total new development footprint cannot exceed 300 acres (0.5 % of total acreage).

**Summer Vehicle Tundra Access:**

***L-1 Required Operating Procedure***

**Objective:** Protect stream banks and water quality; minimize compaction and displacement of soils; minimize the breakage, abrasion, compaction, or displacement of vegetation; protect cultural and paleontological resources; maintain populations of, and adequate habitat for birds, fish, and caribou and other terrestrial mammals; and minimize impacts to subsistence activities.

**Requirement/Standard:** On a case-by-case basis, BLM may permit low-ground-pressure vehicles to travel off of gravel pads and roads during times other than those identified in ROP C-2a. Permission for such use would only be granted after an applicant has:

- a. Submitted studies satisfactory to the AO of the impacts on soils and vegetation of the specific low-ground-pressure vehicles to be used. These studies should reflect use of such vehicles under conditions similar to those of the route proposed for use and should demonstrate that the proposed use would have no more than minimal impacts to soils and vegetation.
- b. Submitted surveys satisfactory to the AO of subsistence uses of the area as well as of the soils, vegetation, hydrology, wildlife and fish (and their habitats), paleontological and archaeological resources, and other resources as required by the AO.
- c. Designed and/or modified the use proposal to minimize impacts to the AO's satisfaction. Design steps to achieve the objectives and based upon the studies and surveys may include, but not be limited to, timing restrictions (generally it is considered inadvisable to conduct tundra travel prior to August 1 to protect ground-nesting birds), shifting of work to winter, rerouting, and not proceeding when certain wildlife are present or subsistence activities are occurring. At the discretion of the AO, the plan for summer tundra vehicle access may be included as part of the spill prevention and response contingency plan required by 40 CFR 112 (Oil Pollution Act) and ROP A-4.



## **Appendix G: Examples of Public Health Mitigation Strategies**







## Appendix G

### Examples of Public Health Mitigation Strategies

The following are examples of strategies for mitigating the impacts of industrial development on public health using the “social determinants of health” framework which have been implemented successfully elsewhere. This discussion is provided by BLM and NSB as a guide to measures which could be adapted for use in the North Slope. The measures included do not represent an exhaustive list. Instead, they are intended as pertinent examples of measures that might be successfully adapted to meet the needs of the affected North Slope communities, in order to mitigate impacts discussed in this IAP/EIS.

Economic and sociocultural conditions are among the most powerful drivers of health and health disparities, particularly in minority and indigenous communities. Internationally, this principle has become a central focus in industrial development and finance efforts. The following organizations have taken a leading role in advocating for a model of development planning which takes full account of the socioeconomic and health effects of development on indigenous and ethnic minority communities, and have published guidelines addressing these issues:

- The World Bank – Operational Policy 4.10, “Indigenous Peoples,” at <http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/tocall/0F7D6F3F04DD70398525672C007D08ED?OpenDocument>
- The International Association of Oil and Gas Producers – “A Guide to Health Impact Assessments in the Oil and Gas Industry,” at [www.ipieca.org/downloads/health/hia/HIA.pdf](http://www.ipieca.org/downloads/health/hia/HIA.pdf)
- Royal Dutch/Shell Health, Safety, and Environment Panel – “Impact Assessment”
- The signatories to the Equator Principles, at [www.equator-principles.com/](http://www.equator-principles.com/)
- International Association of Impact Assessment – “Health Impact Assessment: International Best Practice Principles”  
<http://www.iaia.org/modx/assets/files/SP5.pdf>

The principles and measures outlined here could be adapted, through a process of community consultation, to meet the goals of a “Healthy Neighbors” plan, thus creating a comprehensive and effective strategy for long-term management of the sociocultural, economic, and public health changes discussed in this IAP/EIS.

#### 1. Infectious Disease Prevention:

##### *Examples/Precedents:*

- a. Shell Camisea<sup>1</sup>Project: Shell’s initial oil exploration program in the 1980s was heavily criticized in large part because of epidemics of infectious diseases that

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<sup>1</sup> May P, Dabbs A, et al (1999) Corporate Roles and Rewards in Promoting Sustainable Development: Lessons Learned from Camisea. Energy and Resources Group, U.C. Berkeley. Berkeley, CA. Accessed online on March 23, 2007 at <http://socrates.berkeley.edu/erg/documents/camisea.pdf>



occurred in the indigenous communities after contact with outside oil workers. As a result, Shell consulted with a highly qualified team of scientists and developed a number of interventions to prevent infections. Interventions used included:

- Construction of camps which were physically segregated from the indigenous communities.
- Strict controls on when and how employees were allowed to enter Native villages.
- A requirement for a “health passport,” in which employees were extensively vaccinated and routinely screened for communicable diseases.
- Roadless construction, to prevent entry to the communities by other outside groups or individuals; and strict monitoring and control of employee contact with the indigenous community.

- b. Chad-Cameroon Pipeline: a Health Impact Assessment of this project, done as a requirement for financing set out by the World Bank, revealed the potential that truckers from an area of high-prevalence HIV would trigger an epidemic of HIV in a region of low-prevalence HIV. An intervention involving a relay system, in which workers would drive within their own geographic regions, and relay trucks to drivers in the next region, was designed to prevent transmission.<sup>2</sup>

2. Interaction between outside workforce and local indigenous community:

Recognizing that a large influx of outside workers into a small indigenous community may lead social and cultural conflict and tension (related to issues including acculturation, tensions between work and subsistence, intra-generational conflicts as children adopt modes of behavior and communication mirroring the outside society, and importation of drugs and alcohol), developers in other regions have developed protocols to control interaction between workers and the community. Measures include restricting entry by industry employees to local communities, building camps and facilities separate from communities, and banning or restricting the construction of roads into communities. See Shell’s Camisea project and the Chad-Cameroon Pipeline as examples.

3. Support of subsistence:

Substantial impacts to subsistence – both harvest amounts and dietary intake – are possible under development scenarios resulting from leasing in the planning area. Subsistence foods constitute the primary protection against diabetes and metabolic syndromes (epidemic problems in other American Indian Tribes), food insecurity and hunger. Furthermore, subsistence activities form the foundations of cultural stability and therefore important protections against social pathology. Suitable “replacement foods” are not available: there is no nutritionally equivalent food available for purchase

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<sup>2</sup> Leonard L (2003) Possible illnesses: assessing the health impacts of the Chad Pipeline Project. Bulletin of the World Health Organization 2003; 81: 427-433. Accessed online on March 24, 2007 at [http://www.hiagateway.org.uk/media/hiadocs/HIA\\_Leonard.pdf](http://www.hiagateway.org.uk/media/hiadocs/HIA_Leonard.pdf).

Jobin, W (2003) Health and Equity Impacts of a large oil project in Africa. Bulletin of the World Health Organization. 81: 420-426



in local or regional stores. Furthermore, studies have documented the generally poor nutritional value of store-bought foods available in rural Alaskan villages.

*Examples/Precedents:*

A variety of programs have been used to support subsistence lifestyles and diets, and healthful alternate foods in northern indigenous communities facing the impacts of industrialization

- a. Hunter Support programs: in general, these programs provide financial support for hunters, in return for efforts to hunt for the community. Programs have taken many forms, including support for poor families to purchase gas and equipment, and financial compensation for time spent hunting for community members<sup>3</sup>
- b. Community freezers: the construction of community freezers would facilitate storage of harvested resources for longer periods of time, allowing a more even supply of foods available to the community.
- c. Work Schedule modifications: flexible work schedules, subsistence leave, and job-sharing options may facilitate continued active participation in subsistence while allowing communities to reap the benefits of employment opportunity.

4. Healthy Diet interventions:

If development results in declining intake of subsistence foods (either because of impacts to the availability of resources, more difficult hunting conditions, or because of sociocultural change), North Slope communities will be at increased risk for diabetes, hypertension, hypercholesterolemia, and the resultant increases in cardiovascular and cerebrovascular diseases. The nutritional value of foods in northern village stores is generally quite poor, and people often chose “junk” foods such as chips, sweets, and soft drinks because of the relatively lower cost of these caloric sources. There are evidence-based measures which can support healthy dietary choices with regard to store-bought foods.

*Examples/Precedents*

- a. Johns Hopkins Healthy Stores Program: employs community-directed participatory research to identify barriers to healthy eating, and creates incentives for local stores to stock better food choices. This program has been extensively validated in several indigenous communities, and is currently being piloted with encouraging initial results in Nunavut, Canada.<sup>4</sup>
- b. Food Mail: the government of the Northwest Territories reduced the postage rate for “Nutritious Perishable Food” to encourage families to utilize regional sources of more nutritious store-bought foods.<sup>5</sup>

<sup>3</sup> Chan H, Fediuk K et al. Food Security in Nunavut, Canada: Barriers and Recommendations. International Journal of Circumpolar Health. 65(5) 416-431

Aarluk Consulting Inc (2006) A consultation-based review of the harvester support programs of the Government of Nunavut and Nunavut Tunngavik Inc.

<sup>4</sup> Ho L, Gittelsohn S et al. Development of an integrated diabetes prevention program with First Nations in Canada. Health Promotion International 21(2) 88-97

<sup>5</sup> Indian and Northern Affairs Canada. Food Mail Program Brochure. Online at [http://www.ainc-inac.gc.ca/ps/nap/air/1brofoomai\\_e.html](http://www.ainc-inac.gc.ca/ps/nap/air/1brofoomai_e.html)

Indian and Northern Affairs Canada. Backgrounder: Food mail program. Online at [http://www.ainc-inac.gc.ca/nr/prs/s-d2001/01253bk\\_e.html](http://www.ainc-inac.gc.ca/nr/prs/s-d2001/01253bk_e.html)



5. Economic Sustainability and Sociocultural Impacts:

The “boom and bust” economic cycle (rapid and dramatic economic growth followed by economic depression) that may accompany natural resource development in indigenous communities can create large-scale social and cultural change, and worsen social pathology such as alcohol and substance abuse, domestic violence, and suicide.

*Examples/Precedents*

a. Sakhalin II development: Indigenous Minorities Development Plan:

A plan which assessed the likely socioeconomic effects of planned development on the local indigenous community, and developed and funded a mitigation package targeted at minimizing adverse social and economic outcomes, maximizing potential benefits, and promoting sustainable economic development. Based in part on World Bank OD 4.20 (an older version of OP 4.10). It provides a portfolio of interventions including:

- Business training, start-up support for local businesses
- Health services funding
- Education support, including scholarships for professional training, stipends for low-income students
- Financial support for cultural activities
- Leadership capacity-building: training seminars, computer equipment

b. Economic sustainability through “sustainable savings and investment programs”: for example, Canada’s National Roundtable on the Environment and Economy reviewed resource development in northern indigenous communities and recommended the creation of savings and investment programs specifically targeting long-term fiscal stability for the impacted communities, as well as equitable distribution of the economic benefits of development within the communities such that projects do not create or exacerbate “have and have-not” problems within indigenous communities.<sup>6</sup>

c. Shell Camisea – development plan focused on sustainable development through building and supporting social capital:

- In partnership with a regional NGO, developed a socio-economic assessment and plan for sustainable development.
- Shell engaged the Smithsonian Institution’s Conservation Biology Institute to prepare a biodiversity assessment and monitoring plan, and committed resources to ongoing monitoring, which drove an adaptive management strategy.
- Investment strategy: strengthen existing local organizations (e.g. ‘Mother’s Clubs’) which were able to fund and administer local projects.

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Lawn J, Harvey D (2001) Change in nutrition and food security in two Inuit communities, 1992-1997. Minister of Public Works and Government Services Canada. Ottawa, Canada.

<sup>6</sup> National Roundtable on the Environment and the Economy (2005). Aboriginal Communities and Non-renewable Resource Development. Online at [www.nrtee-trnee.ca/Publications/PDF/SOD\\_Aboriginal\\_E.pdf](http://www.nrtee-trnee.ca/Publications/PDF/SOD_Aboriginal_E.pdf)



## **Appendix H: Common, Scientific and Inupiaq Names of Species Listed in Supplemental IAP/EIS**







## Appendix H

### COMMON, SCIENTIFIC, AND IÑUPIAQ NAMES OF SPECIES LISTED IN SUPPLEMENTAL IAP/EIS

Common Name	Scientific Name	Iñupiaq Name <sup>1</sup>
<b>VEGETATION</b>		
<b>Small Trees and Shrubs</b>		
Alpine blueberry	<i>Vaccinium uliginosum</i>	Subaq/asriavik/asiaq/asiavik
Cloudberry	<i>Rubus chamaemorus</i>	Aqpik
Crowberry	<i>Empetrum nigrum</i>	Paunbaq
Dwarf birch	<i>Betula nana</i> ssp. <i>exilis</i>	—
Lapland cassiope	<i>Cassiope tetragona</i>	Ikubutigiksut
Lingonberry	<i>Vaccinium vitis-idaea</i>	Kikmieeq/kipmifnaq
Northern labrador tea	<i>Ledum palustre</i> ssp. <i>decumbens</i>	Tilaaqiaq
Mountain alder	<i>Alnus viridis</i> ssp. <i>crispa</i>	—
<b>Grasses</b>		
(unknown)	<i>Poa lanata</i>	—
Alkali grass	<i>Puccinellia phryganodes</i>	—
Alaska bluegrass	<i>Poa hartzii</i> ssp. <i>alaskana</i>	—
Pendent grass	<i>Arctophila fulva</i>	—
Polar grass	<i>Arctagrostis latifolia</i>	—
False semaphoregrass	<i>Pleuropogon sabinei</i>	—
Eurasian Junegrass	<i>Koeleria asiatica</i>	—
Tufted hairgrass	<i>Deschampsia cespitosa</i>	—
<b>Sedges</b>		
Cottongrass	<i>Eriophorum angustifolium</i>	—
Cottongrass	<i>Eriophorum russeolum</i>	—
Tussock cottongrass	<i>Eriophorum vaginatum</i> L.	Maniq
Water sedge	<i>Carex aquatilis</i>	—
<b>Wildflowers</b>		
fewflower draba	<i>Draba pauciflora</i>	—
Drummond's bluebell	<i>Mertensia drummondii</i>	—
Fireweed	<i>Epilobium latifolium</i>	Quppigutaq
Marsh fivefinger	<i>Potentilla palustris</i>	—
Marsh marigold	<i>Caltha palustris</i>	—
Pygmy aster	<i>Aster pygmaeus</i>	—
Scurvy grass	<i>Cochlearia officianalis</i>	—



Common Name	Scientific Name	Iñupiaq Name <sup>1</sup>
Stipulated cinquefoil	<i>Potentilla stipularis</i>	—
Sweet coltsfoot	<i>Petasites frigidus</i>	—
<b>FISH</b>		
<b>Freshwater Species</b>		
Alaska blackfish	<i>Dallia pectoralis</i>	Ihuuqiniq
Arctic char	<i>Salvelinus alpinus</i>	—
Arctic grayling	<i>Thymallus arcticus</i>	Sulukpaugaq
Burbot	<i>Lota lota</i>	Tittaaliq
Lake trout	<i>Salvelinus namaycush</i>	Iqaluaqpak
Longnose sucker	<i>Catostomus catostomus</i>	Milugiaq
Ninespine stickleback	<i>Pungitius pungitius</i>	Kakalisaaauraq
Northern pike	<i>Esox lucius</i>	Siulik
Round whitefish	<i>Prosopium cylindraceum</i>	Savigunnaq
Slimy sculpin	<i>Cottus cognatus</i>	Kanayuuq
Threespine stickleback	<i>Gasterosteus aculeatus</i>	—
<b>Anadromous Species</b>		
Arctic cisco	<i>Coregonus autumnalis</i>	Qaataq
Arctic lamprey	<i>Lampetra japonica</i>	Nimigiaq
Bering cisco	<i>Coregonus laurettae</i>	Tiipuq
Chinook (king) salmon	<i>Oncorhynchus tshawytscha</i>	—
Chum salmon	<i>Oncorhynchus keta</i>	Iqalugruaq
Pink salmon	<i>Oncorhynchus gorbuscha</i>	Amaqtuuq
Rainbow smelt	<i>Osmerus mordax</i>	Ihhaugniq
Sockeye (red) salmon	<i>Oncorhynchus nerka</i>	—
<b>Amphidromous Species<sup>2</sup></b>		
Broad whitefish	<i>Coregonus nasus</i>	Aanaaqliq
Dolly varden	<i>Salvelinus malma</i>	Iqalukpik
Humpback whitefish	<i>Coregonus pidschian</i>	Piquktuuq
Least cisco	<i>Coregonus sardinella</i>	Iqalusaaq
<b>Marine Species</b>		
Arctic cod	<i>Boreogadus saida</i>	Uugaq
Arctic flounder	<i>Liopsetta glacialis</i>	Nataagnaq/Puyyagiaq
Capelin	<i>Mallotus villosus</i>	Panmigriq
Fourhorn sculpin	<i>Myoxocephalus quadricornus</i>	Kanayuuq
Kelp snailfish	<i>Liparis tunicatus</i>	—
Pacific herring	<i>Clupea harengus</i>	Uqsruqtuuq
Pacific sandlance	<i>Ammodytes hexapterus</i>	—
Saffron cod	<i>Eleginus gracilis</i>	Uugaq
Arctic cod	<i>Boreogadus saida</i>	Uugaq



Common Name	Scientific Name	Iñupiaq Name <sup>1</sup>
<b>BIRDS</b>		
<b>Seabirds</b>		
Arctic tern	<i>Sterna paradisea</i>	Mitqutailxaq
Black guillemot	<i>Cepphus grylle</i>	Ifabiq
Glaucous gull	<i>Larus hyperboreus</i>	Nauyavasrugruk
Long-tailed jaeger	<i>Stercorarius longicaudus</i>	Isuffaq
Parasitic jaeger	<i>Stercorarius parasiticus</i>	Mibiaqsaayuk
Pomarine jaeger	<i>Stercorarius pomarinus</i>	Isuffabluk
Sabine's gull	<i>Xema sabini</i>	Aqargigiaq
<b>Loons</b>		
Pacific loon	<i>Gavia pacifica</i>	Malbi
Red-throated loon	<i>Gavia stellata</i>	Qaksrauq
Yellow-billed loon	<i>Gavia adamsii</i>	Tuutlik
<b>Waterfowl</b>		
Brant	<i>Branta nigricans</i>	Niblinbaq
Canada goose	<i>Branta canadensis</i>	Iqsrabutlik
Common eider	<i>Somateria mollissima</i>	Amauligruaq
King eider	<i>Somateria spectabilis</i>	Qifalik
Lesser snow goose	<i>Anser caerulescens caerulescens</i>	—
Long-tailed duck	<i>Clangula hyemalis</i>	Aahaaliq
Northern pintail	<i>Anas acuta</i>	Kurugaq
Scaup	<i>Aythya</i> spp.	—
Scoter	<i>Melanitta</i> spp.	—
Spectacled eider	<i>Somateria fischeri</i>	Qavaasuk
Steller's eider	<i>Polysticta stelleri</i>	Igniqauqtuq
Tundra swan	<i>Cygnus columbianus</i>	—
White-fronted goose	<i>Anser albifrons</i>	Kigiyuk/nibливаixuk
<b>Shorebirds</b>		
American golden-plover	<i>Pluvialis dominica</i>	Tullik
Baird's sandpiper	<i>Erolia bairdii</i>	Puviaqtuuyaaq
Bar-tailed godwit	<i>Limosa lapponica</i>	Turraaturaq
Black-bellied plover	<i>Squatarola squatarola</i>	Tullikpak
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	Satqagiixaq
Dunlin	<i>Erolia alpina</i>	Siiyukpaligauraq
Long-billed dowitcher	<i>Linnodromus scolopaceus</i>	Siiyukpalik
Pectoral sandpiper	<i>Erolia melanotos</i>	Puviaqtuuq
Red phalarope	<i>Phalaropus fulicarius</i>	Auksruaq
Red-necked phalarope	<i>Phalaropus lobatus</i>	—
Ruddy turnstone	<i>Arenaria interpres</i>	Tullignaq



Common Name	Scientific Name	Iñupiaq Name <sup>1</sup>
Semipalmated sandpiper	<i>Ereunetes pusillus</i>	Livilivillakpak
Stilt sandpiper	<i>Micropalama griseus</i>	—
<b>Raptors</b>		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Tifmiaqpak
Gyrfalcon	<i>Falco rusticolus</i>	—
Northern harrier	<i>Circus cyaneus</i>	Papiktuuq
Peregrine falcon	<i>Falco peregrinus</i>	Kirgavik
Rough-legged hawk	<i>Buteo lagopus</i>	Qixbiq
Short-eared owl	<i>Asio flammeus</i>	Nipaiouktaq/nipaixuktaq
Snowy owl	<i>Nyctea scandiaca</i>	Ukpik
<b>Ptarmigan</b>		
Willow Ptarmigan	<i>Lagopus lagopus</i>	—
Rock ptarmigan	<i>Lagopus mutus</i>	Niqsaaqtufiq
<b>Passerine</b>		
Common raven	<i>Corvus corax</i>	Tulugaq
Lapland longspur	<i>Calcarius lapponicus</i>	Qupajuk/putukiiq
Redpoll	<i>Acanthis spp.</i>	Saqsakiq
Savannah sparrow	<i>Passerculus sandwichensis</i>	Aanaruie suliuqpa
Snow bunting	<i>Plectrophenax nivalis</i>	Amautligaq/avatalibuuvag/ amautlikkauraq/amaujigaaluk
<b>MAMMALS</b>		
<b>Large Mammals</b>		
Arctic fox	<i>Alopex lagopus</i>	Qusrhaaq/tibiganniaq/qujhaaq
Caribou	<i>Rangifer tarandus</i>	Tuttu
Dall sheep	<i>Ovis dalli dalli</i>	Imnaiq/ipnaiq
Gray wolf	<i>Canis lupus</i>	Amabug
Grizzly (brown) bear	<i>Ursus arctos</i>	Akjaq
Lynx	<i>Lynx canadensis</i>	Niutuuyiq/niutuiyiq/nuutuuyiq
Moose	<i>Alces alces</i>	Tiniikaq/tuttuvak/tiniika
Muskox	<i>Ovibos moschatus</i>	Umifmak/imummak
Red fox	<i>Vulpes vulpes</i>	Kavviaq/kayuqtuq
Wolverine	<i>Gulo gulo</i>	Qavvik/qapvik
<b>Small Mammals</b>		
Arctic ground squirrel	<i>Spermophilus parryii</i>	Siksrik
Barrenground shrew	<i>Sorex ugyunak</i>	—
Brown lemming	<i>Lemmus trimucronatus</i>	Aviffaq
Collared lemming	<i>Dicrostonyx groenlandicus</i>	Qixafmiutauraq
Ermine (short-tailed weasel)	<i>Mustela erminea</i>	Itibiaq/tibiaq
Least weasel	<i>Mustela nivalis</i>	—



Common Name	Scientific Name	Iñupiaq Name <sup>1</sup>
Northern red-backed vole	<i>Clethrionomys rutilus</i>	—
Singing vole	<i>Microtus miurus</i>	Avieeq
Snowshoe hare	<i>Lepus americanus</i>	Ukalliuraq/ukalliq
Tundra shrew	<i>Sorex tundrensis</i>	Ugrufnaq
Tundra vole	<i>Microtus oeconomus</i>	Avieeq
<b>Other Mammals</b>		
Coyote	<i>Canis latrans</i>	Amabuuraq
Mink	<i>Mustela vison</i>	Tibiaqpak
Porcupine	<i>Erethizon dorsatum</i>	Ixuqutaq/qifabluk
River otter	<i>Lutra canadensis</i>	Pamiuqtuuq
<b>Marine Mammals</b>		
Bearded seal	<i>Erignathus barbatus</i>	Ugruk
Beluga whale	<i>Delphinapterus leucas</i>	Sisuaq/kilalugak
Bowhead whale	<i>Balaena mysticetus</i>	Abviq
Polar bear	<i>Ursus maritimus</i>	Nanuq
Ringed seal	<i>Phoca hispida</i>	Qaibulik/qaibutlik
Spotted seal	<i>Phoca largha</i>	Qasigiaq
<sup>1</sup> Iñupiaq names from web site edition of <i>Iñupiat Eskimo Dictionary</i> : <a href="http://www.alaskool.org/language/dictionaries/inupiaq/dictionary.htm">[http://www.alaskool.org/language/dictionaries/inupiaq/dictionary.htm]</a> . Accessed on April 22, 2004. <sup>2</sup> Have some components of their populations that remain in freshwater year-round. <sup>3</sup> Principal (most commonly caught) coastal fish only.		







## **Appendix I: Historic Sites**







## APPENDIX I

### Documented Alaska Heritage Resource Services Sites and Traditional Land Use Inventory Sites in the Northeast National Petroleum Reserve - Alaska

Table I-1. Documented Alaska Heritage Resource Services Sites

AHRS NO.	OTHER NO. <sup>1</sup>	SITE NAME	DESCRIPTION	DATE/PERIOD
<b>Prehistoric</b>				
HAR-002	NSB CRSI 2278	HAR-002	Scattered artifacts (e.g., flint spall, ground slate, cut antler, ivory harpoon dart head, bird bone). By 1980, site was destroyed by erosion.	Prehistoric
HAR-003		HAR-003	Isolated black chert flake, carved tent stake, pole.	Prehistoric
HAR-009		HAR-009	Isolated tan chert flake.	Prehistoric
HAR-047		HAR-047	Gray chert artifacts (e.g., tip/midsection of endblade (ASTt), flake core, retouched flake), scattered bones, bone fragments.	Prehistoric (ASTt)
HAR-050		HAR-050	Four black chert flakes.	Prehistoric
HAR-155	TLUI 63	UYAGAGVIIT (UYAGAGVIK)	Beach used as quarry for net weight stones, remains of wall tent/ wooden stakes - used for trapping, hunting, fishing, game lookout.	Prehistoric
HAR-169*	TLUI 58 & +6	NEGILIK (NILIK, NERLIK, NIRLIK, NECHELIK, WOODS' INAAT, WOODS CAMP)	Historic/prehistoric trading - smokehouse/drying rack, generator shed with motor, storage houses, the Woods' residence house, wood covered ice cellar, 3 graves, buildings belonging to the Helmericks, 4 sod house ruins, camp area (surface scatter of caribou bone, antler, fire-cracked rock, wood, bone and stone artifacts).	Prehistoric/Historic (AD 1930s-1940s)
IKR-058	ROS 78-005	IKR-058	Cranium of a large mammal with unassociated shotgun shell and candy bar wrappers nearby.	Prehistoric
IKR-073		IKR-073	A single chert waste flake.	Prehistoric
TES-002	ROS 78-011	PAPTAUN	Fishing and hunting camp (e.g., small firepits, bone, canvas cloth, tin cans, cut/sawn caribou antler, 2 chert flakes, cork float fragment, and caribou antler net sinker).	Prehistoric/Historic
TES-004		TES-004	A single chert flake.	Prehistoric
TES-005		TES-005	An isolated Putu-like projectile point base.	Prehistoric
TES-007		TES-007	Isolated chert flake.	Prehistoric
TES-008		TES-008	Isolated projectile point.	Prehistoric (Norton?)
TES-009		TES-009	Isolated flake knife.	Prehistoric (late ASTt - Norton/Ipiutak?)
TES-012		TES-012	Small scatter of lithics, including 12 flakes, a rough biface, and a projectile point or knife.	Prehistoric (Denbigh or ASTt?)



AHRS NO.	OTHER NO. <sup>1</sup>	SITE NAME	DESCRIPTION	DATE/PERIOD
TES-014		TES-014	Scattered cultural material from a large multicomponent site (e.g., microblades, obsidian point base, bullet, biface segment, projectile point fragment, pottery, arrowshaft base, quartzite hammerstone, debitage, walrus ivory, cracked caribou bone, flakes, recent debris).	Prehistoric/Historic
TES-015		TES-015	A wooden kayak/sled piece, 3 bone sled-shoe pieces (stone-drilled holes).	Prehistoric
TES-020		TES-020	Two rectangular sod house ruins, large sod meat cellar/storage facility. No historic items.	Prehistoric
TES-051			Microblade and weathered caribou bones.	Prehistoric
TES-054		T78-1	Chert flakes.	Prehistoric
TES-057		KEALOCK	Dark brown and black chert flakes.	Prehistoric (early Holocene)
UMI-001	Solecki 26	UMI-001	Approximately 10-15 waste flakes scattered over a wide area on a pronounced bench or knoll.	Prehistoric
UMI-002		UMI-002	Scattered artifacts (e.g., 20+ flakes - small blade-like flake fragments and bone fragments).	Prehistoric
UMI-003		UMI-003	Isolated side blade.	Prehistoric
UMI-004		UMI-004	Six waste flakes.	Prehistoric
UMI-005		UMI-005	Collapsed cairn and large flake scatter (e.g., 500+ flakes [sections of blade-like flakes/utilized flakes], bifaces and biface fragments).	Prehistoric
UMI-006	ROS78-003	UMI-006	Small lithic scatter (e.g., 25+ waste flakes/utilized flakes, blade-like flake, 30.06 shell casing and caribou rack).	Prehistoric/Historic
<b>Historic</b>				
HAR-004	TLUI 70	KITIK	Quarry for the material known as <i>kitik</i> ("pulverized stone"), a fine-grained volcanic ash used traditionally in skin processing. Important Iñupiat traditional cultural property.	Historic
HAR-005			Sod house and boat.	Historic
HAR-006			Antler artifact and caribou bones on the beach at a drained lake.	Historic
HAR-007			Reindeer herding driftwood fence/tent platforms.	Historic
HAR-010		KIKKAQ	Wooden marker surrounded by cobbles that commemorates a favorite camping area.	Historic (AD 1970s)
HAR-011	TLUI 43 NSB CRSI 2241	SIKULIK	Subsistence camp - standing cabin, sod house pit, wood-covered ice cellar, and grave.	Historic to modern
HAR-012	TLUI 46 NSB CRSI 2244	AGKI	House, sod house pit (e.g., wall timbers, corner posts, floor boards/collapsed ceiling remains, reindeer bones, skulls, antlers topped by a yellow plastic wind survey disk, a fox trap, and scattered surface debris).	Historic (AD 1920s)
HAR-013	NSB CRSI A	UGUAK (OYAGAK)	House pits/sod house ruins, recent cabins, dog tether stakes, scattered surface historic artifacts (e.g., enameled "honey pot," Thermos bottle), and an ice cellar with an intact wooden entry frame.	Historic



AHRS NO.	OTHER NO. <sup>1</sup>	SITE NAME	DESCRIPTION	DATE/PERIOD
HAR-014	NSB CRSI 2279	HAR-014	Reindeer corral complex of drift logs set vertically and close together into the ground and the remains of a semi-subterranean house.	Historic (1930s)
HAR-018	NSB CRSI B	AHSOGEAK SITE	An area of fallen logs, scattered surface historic artifacts (e.g., stove, mirror, blue china).	Historic
HAR-019	TLUI 38 NSB CRSI 2238	ISUK (CAPE HALKETT)	Isook/Esook Trading Post - NSB TLUI #38 reports 9+ graves and 1+ ice cellars.	Historic
HAR-020	TLUI 44 NSB CRSI 2242	IKALUURUAK	A cabin, 2 graves, and 2 ice cellars.	Historic (AD 1927)
HAR-021	TLUI 45 NSB CRSI 2243	NIGLIVIK 1	Tent sites and ice cellars.	Historic
HAR-022	TLUI 49 NSB CRSI 2245	SAKITUI (SAKTUINA POINT)	Edwardsen's Trading Post - sod houses and 1+ graves. Most/all features have eroded away.	Historic
HAR-023	TLUI 42 NSB CRSI 2240	APALLIVIK	NSB TLUI #42 reports a tent campsite.	Historic
HAR-024	TLUI 50 NSB CRSI 2246	QIQIKTAG	NSB TLUI #50 reports "several small low islands...occasionally used as tent sites."	Historic
HAR-025	TLUI 51 NSB CRSI 2247	TIKIGAQMIUT (TIKIRAGMIUT, ESKIMO ISLANDS)	NSB TLUI #51 reports this as an "old cemetery of Point Hope people who were kept from going ashore by area residents" and eventually starved to death.	Historic
HAR-026	TLUI 52 NSB CRSI 2248	ATIGARU POINT (ATIGRUK POINT, AMAULIK)	NSB TLUI #52 reported graves, sod house ruins, tent sites, storage rack, recent wooden rack, caribou bone, skull and antler rack, rusted traps, fuel drums, and recent debris.	Historic
HAR-027	TLUI 53 NSB CRSI 2249	KANIGLUQ	NSB TLUI #53 reported sod house ruins and/or ice cellars.	Historic
HAR-028	TLUI 55 NSB CRSI 2250	NUKRUAPAITC H	Reported hunting and camping area.	Historic
HAR-029	TLUI 56 NSB CRSI 2251	IKKALIPIK	At least one sod house was reported here - site destroyed by erosion by 2000.	Historic
HAR-030	NSB CRSI 2276	HAR-030	A single sod house.	Historic
HAR-044			Recently tended grave.	Historic to modern
HAR-048		HAR-048	Sod house ruins (e.g., sod house remains, scattered surface debris [e.g., sheet metal wood stove, old lantern, tin cans, caribou rack]).	Historic (AD 1920-1930s)
HAR-049		HAR-049	A scatter of historic artifacts (e.g., tin lids, burned and fragmented caribou bone). The site is probably an activity area (possibly caribou processing) of HAR-048.	Historic (AD 1920-1930s)
HAR-051			Historic remains.	Historic
HAR-053		HAR-053	An isolated human skull that was released to the Native community for re-burial.	Historic
HAR-054		NECHELIK CHANNEL LIFEBOAT		Historic
HAR-058			U.S. Coast & Geodetic Survey bronze memorial	Historic
HAR-065			Small sod house foundation.	Historic
HAR-156	TLUI 60	NANUQ (NANUK, NANOOK)	Two sod house ruins occupied by 2 families of reindeer herders, 4 storage pits, 2 sod quarries, dog tethers, and scattered historic debris.	Historic (AD 1920s)
HAR-157	TLUI 45	NIGLIVIK 2	Sod house ruin, cache pit, sod quarry, and surface historic artifacts.	Historic



AHRS NO.	OTHER NO. <sup>1</sup>	SITE NAME	DESCRIPTION	DATE/PERIOD
HAR-158	TLUI 80	PUTU	Two sod house ruins, sod quarry, 2 fish curing pits, ice cellar, whale boat stern, and artifacts.	Historic
HAR-00159		NUIQSAPIAQ (FIRST NUIQSUT, NUIQSUTPIAT)	Five sod house ruins, ice cellar, sod quarries, and wooden stakes (tethers), tenting area, historic debris. Original village of Nuiqsut people, until flooding (1930s) forced move to Niglinaat (HAR-160).	Historic
TES-003		TES-003	Remains of a beached flat-bottomed, wood boat and hand axe (associated with the NARL cabin).	Historic
TES-006		TES-006	Camp site with artifacts (e.g., 2 carved tent pegs, worked wood object, sawn antler, hammerstone, tin can, pottery paddle, chopped/cut wood fragments, scattered caribou bone).	Historic
TES-011		TES-011	Isolated artifact-single-bladed kayak/boat paddle.	Historic
TES-013		TES-013	Isolated bear canine tooth (sawn/drilled), hematite/iron oxide, and caribou bones.	Historic
TES-016		TES-016	Isolated antler knife handle (2 small drilled holes and thin rectangular slot for metal blade).	Historic
TES-017		HORSE HEAD SITE	Two sod house ruins, a sod tent ring, 2 storage cellars, collapsed wood structure, mandible and skull of a Pleistocene horse, and historic debris.	Paleontological/ Historic
TES-018		TES-018	Historic remains (e.g., cracked/sawn caribou bone, 2 chert flakes, Euro-american items).	Historic (AD 1900s)
TES-019		TES-019	Tent ring structures marked by carved wooden stakes, sod blocks, and historic debris.	Historic (AD 1900s)
TES-021		TES-021	Five fire pits surrounded by sod windbreaks, sail cloth fragments, charred willow/alder, and bone.	Historic
TES-022			Umiak? remains.	Historic
TES-023			Caribou kill site.	Historic
TES-026		NW PIK DUNE SITE BLM SITES		Historic
TES-028		KOLOVIK	Trapping/trading location (e.g., standing houses, collapsed structures, 2 whaleboats, at least 4 surface burials).	Historic
TES-032			Lonely Long Range Radar Site (LRRS; POW-1) DEW-line facilities.	Historic
TES-033			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-034			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-035			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-036			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-036			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-038			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-039			Lonely LRRS (POW-1) DEW-line facilities.	Historic



AHRS NO.	OTHER NO. <sup>1</sup>	SITE NAME	DESCRIPTION	DATE/PERIOD
TES-040			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-041			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-042			Lonely LRRS (POW-1) DEW-line facilities.	Historic
TES-043**			Lonely Short Range Radar Site (SRRS) road system [White Alice Communications (WACS), Aircraft Control & Warning (AC&W)].	Historic
TES-044**			Lonely SRRS airfield [WACS, AC&W]	Historic
TES-045**			Lonely SRRS gravel pad system [WACS, AC&W].	Historic
TES-046			Sod houses.	Historic
TES-047		NW PIK DUNES SITE		Historic
TES-048**		POW-1 (LONELY) [DEW-LINE]	Auxiliary station of the DEW-line with train with rotating radar/support facilities, airstrip, pumphouse, warehouse, storage structures.	Historic (AD 1950s)
TES-049		IGSINAT (IGSINNAT)		Historic
TES-050		IGSUGVIK (IKSUGVIK)		Historic
TES-055		T78-2	Regal pail.	Historic
TES-056		T78-3	Caribou bones and shells.	Historic
UMI-007			Sod house.	Historic
UMI-091		KIK RIVER	Three 4' willow poles (ax sharpened), and rock ringed hearth.	Historic
UMI-103		UMIAT NPR-4 TEST WELL 2		Historic
UMI-104		UMIAT NPR-4 TEST WELL 5		Historic

<sup>1</sup> Multiple site numbers are provided in the AHRS database (e.g., TLUI, NSB CRSI, ROS).

\* NHR (listed on the National Register of Historic Places).

\*\* NRE (determined eligible for the National Register of Historic Places).

Source: Alaska Department of Natural Resources. 2004. *Alaska Heritage Resource Survey*. Division of Parks and Outdoor Recreation, Office of History and Archaeology.



**Table I-2. Documented Traditional Land Use Inventory Sites**

TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUIHAR001		APALILVIK		FISHING/HUNTING AREA.
TLUIHAR002		APALILVIUM KUUWA	APALILVIK RIVER.	FISHING/HUNTING AREA.
TLUIHAR003		UQALIUM KAWIBAWA		FISHING/HUNTING AREA. OLD REINDEER HERDING CORRAL.
TLUIHAR004		TULUGAQ	TULUGAQ LAKE.	FISHING/HUNTING AREA.
TLUIHAR005		UQALIK	WITH A TONGUE.	FISHING/HUNTING AREA.
TLUIHAR006		INIBRUAT		OLD RUINS. HUNTING AREA.
TLUIHAR007		NARVABAURAQ	A SMALL LAKE.	FISHING/HUNTING AREA.
TLUIHAR008		TULUKKAM KUUWA	TULUGAQ RIVER.	FISHING/HUNTING AREA.
TLUIHAR009		SIKULIUM PAAWA	ENTRY/MOUTH OF THE SIKULIK RIVER.	FISHING/HUNTING AREA.
TLUIHAR010		SIKULIUM KUUWA	SIKULIK RIVER.	FISHING/HUNTING AREA.
TLUIHAR011		SIKULIUM IGLUA		CABIN. FISHING/HUNTING AREA.
TLUIHAR012		SIKULIUM NARVAWA	SIKULIK LAKE.	GRAVES/OLD RUINS. FISHING, CAMPING, HUNTING AREA.
TLUIHAR013	TLUI 48	NUYAPISUT		DRIFTWOOD AREA. TRAPPING/ HUNTING AREA.
TLUIHAR014		KIPUTIT		FISHING, TRAPPING, NESTING, HUNTING AREA.
TLUIHAR015		SAVIKPALIGAURAM IOITUBLIA		OLD SOD HOUSE RUINS. FISHING/ HUNTING AREA.
TLUIHAR016	TLUI 49	SAKTUI	SAKTUI ISLANDS.	SOD HOUSE RUINS/GRAVE SITE. A TRADING POST ONCE OWNED BY EDWARDSSEN (NOT IN OPERATION). TRAPPING/HUNTING AREA (CARIBOU/SEALS).
TLUIHAR017		AYUVIOAM IEUVIA		GRAVESITE. HUNTING AREA.
TLUIHAR018		QAAQFIQ		FISHING, CARIBOU/GEESE HUNTING AREA.
TLUIHAR019		QUUNBUQ		FISHING/HUNTING AREA.
TLUIHAR020		KURRIUN		FISHING/HUNTING AREA.
TLUIHAR021		KUUGRUK	KUUGRUK RIVER.	FISHING/HUNTING AREA. EIDER NESTING AREA.
TLUIHAR022		KUUGRUK	KUUGRUK RIVER.	FISHING/HUNTING AREA. EIDER NESTING AREA.
TLUIHAR023		AYUVIOA	PLACE NAME DERIVED FROM A PERSON.	HUNTING AREA.
TLUIHAR024		QUUNBUQ		FISHING/HUNTING AREA.
TLUIHAR025		IKKALBUBRUAQ		TWO GRAVES, 2 CELLARS, CABIN (1927). FISHING/GEESE HUNTING AREA.
TLUIHAR026		IKKALBUBRUAM NARVAWA	IKKALGUGRUAQ LAKE.	FISHING/HUNTING AREA.
TLUIHAR027		QITIQ		HUNTING AREA.



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUIHAR028		ANNABUTCHIM KUUWA	ANNAGUTCHIQ RIVER.	FISHING/HUNTING AREA.
TLUIHAR029	TLUI 46	AKI (AGKI)		SOD HOUSE RUINS. HUNTING, CAMPING, TRAPPING AREA.
TLUIHAR030		NIBLIVIGAURAM KUUBUURAWA	NIGLIVIGAURAQ CREEK.	FISHING/HUNTING AREA.
TLUIHAR031		NIBLIVIGAURAM NARVAWI	NIGLIVIGAURAQ LAKES.	FISHING, TRAPPING, GEESE/ CARIBOU HUNTING AREA.
TLUIHAR032		ITIVLIQPAK	A BIG PLACE TO CROSS OVERLAND.	
TLUIHAR033		NIBLIVIGAURAM NARVAWA	NIGLIVIGAURAQ (A PLACE WHERE WHITE-FRONTED GEESE ARE FOUND) LAKE.	FISHING/HUNTING AREA.
TLUIHAR034	379	ISULIUMANIQ		FISHING/HUNTING AREA.
TLUIHAR035		TIWMIAQPALIK		FISHING, CARIBOU/GEESE HUNTING AREA.
TLUIHAR036		KUUGRUK		FISHING/HUNTING AREA. EIDER NESTING AREA.
TLUIHAR037		IQALUAQPALIK		FISHING, CARIBOU/GEESE HUNTING AREA.
TLUIHAR038		SAVIKPALIGAUAM IOITUBLIA		SOD HOUSE RUINS. FISHING/ HUNTING AREA.
TLUIHAR039		SIKULIUM KUUWA	SIKULIK RIVER.	FISHING/HUNTING AREA.
TLUIHAR040		AYUVIOA	PLACE NAME DERIVED FROM A PERSON.	HUNTING AREA.
TLUIHAR043		UBIABNAM IOITUBLIA		SOD HOUSE RUINS. FISHING, TRAPPING, HUNTING, CAMPING AREA.
TLUIHAR044		IKPITCHIAQ	A NEWLY FORMED HILL.	HUNTING AREA.
TLUIHAR045		NUNAM ISUA	THE END OF THE TUNDRA.	FISHING, TRAPPING, HUNTING AREA.
TLUIHAR047		PUBBIM PAAWA	MOUTH OF PUGGIQ BAY.	FISHING/HUNTING AREA.
TLUIHAR048		KAWITQUTCHAAM KUUWA	KANGITQUTCHAAK RIVER.	FISHING/HUNTING AREA.
TLUIHAR049		IKPITCHIAM PUBBIA	IKPITCHIAQ BAY.	FISHING/HUNTING AREA.
TLUIHAR051		UQSRUALUUM PAAWA	ENTRY/MOUTH OF THE UQSRUALUK RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUIHAR052		PUBBIQ	PUGGIQ LAKE.	FISHING/HUNTING AREA.
TLUIHAR053		IMAQPAK	A LITTLE LARGER THAN A SMALL BODY OF WATER.	FISHING/HUNTING AREA.
TLUIHAR054		IMAQPAURAQ	SMALL WATER.	FISHING/HUNTING AREA.
TLUIHAR055		UQSRUALUUM KUUWA	UQSRUALUK RIVER.	FISHING, TRAPPING, AND HUNTING AREA.
TLUIHAR057		QAUGAGUIQSAABVIK	LAST PLACE HUNTERS CAN BE ASSURED OF GETTING DUCKS.	A CEMETERY IS LOCATED AT THIS SITE.
TLUIHAR058		UQSRUALUUM NARVAWA	UQSRUALUK LAKE.	FISHING, TRAPPING, HUNTING AREA.
TLUIHAR059				NO DATA
TLUIHAR060				NO DATA
TLUIHAR061				NO DATA
TLUIHAR062				NO DATA



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUIHAR063				NO DATA
TLUIHAR064				NO DATA
TLUIHAR067				NO DATA
TLUIHAR068				NO DATA
TLUIHAR075				NO DATA
TLUIHAR077				NO DATA
TLUIHAR080				NO DATA
TLUIHAR086				NO DATA
TLUIHAR087				NO DATA
TLUIHAR088				NO DATA
TLUIHAR089				NO DATA
TLUIHAR090				NO DATA
TLUIHAR091				NO DATA
	TLUI 1	UGIIN		CABINS, SOD HOUSE RUINS, WINTER FURBEARER HUNTING.
	TLUI 4	NIGLIGIAQ		FISHING, FURBEARER/CARIBOU HUNTING AREA.
	TLUI 8	IGLUPARAK		FISHING AREA.
	TLUI 43	SIKULIK		CABINS, SOD HOUSE RUINS, GRAVES. FISHING AREA.
	TLUI 44	IKALUURUAK		CABIN, ICE CELLARS, GRAVES, FISHING, WINTER CARIBOU HUNTING AREA.
	TLUI 53	KANGIGKUQ (KANGIGLUQ)		SOD HOUSE RUINS, OLD FISH CAMP. FISHING/TRAPPING AREA.
	TLUI 54	NIAQUQTURUQ		SOD HOUSE RUINS. FISHING, DUCK HUNTING, BIRD NESTING AREA.
	TLUI 55	NIKRUAPAITCH		HUNTING, CAMPING, BIRD NESTING AREA.
	TLUI 61	NUIQSUT		GRAVES (CEMETERY). FISHING, TRAPPING, HUNTING, CAMPING AREA. CURRENT SITE FOR THE COMMUNITY OF NUIQSUT.
	TLUI 72	ILLANIKRUAK, ILANNIK		FISHING/TRAPPING AREA.
	TLUI 78	KAYAKTUAGIAK		FISHING, HUNTING, CAMPING AREA.
	TLUI 81	ITTIGIAK, OCEAN POINT		HUNTING/BERRY HARVESTING.
TLUIIKR019		IKPIKPAUM KUUWA	IKPIKPAK (FOOTHILLS) RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUIIKR021		QUBLUQTUM PAAWA	ENTRY/MOUTH OF THE QUGLUKTUQ RIVER.	FOSSIL MATERIAL. LANDMARK FOR PEOPLE TRAVELING FROM SMITH BAY TO HUNT CARIBOU.
TLUIIKR022		QUBLUQTUM KUUWA	QUGLUQTUQ RIVER.	A STOPOVER PLACE. CARIBOU HUNTING AREA.



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUIIKR023		IKPIKPAUM KUUWA	IKPIKPAK (FOOTHILLS) RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUIIKR024		SANNIWARUAQ	A RIVER FLOWING SIDEWAYS	MAJOR CARIBOU HUNTING AREA. PEOPLE CROSSED HERE TO BEGIN TRAVELING TO THE COLVILLE TO HUNT CARIBOU.
TLUIIKR026		IKPIKPAUM KUUWA	IKPIKPAK (FOOTHILLS) RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUIIKR038		QIRUIEAQ, BRONX CREEK	QIRUILAQ (PLACE WITHOUT WOOD) RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUIIKR051				NO DATA
TLUITES043		IMABRUAM AWMALUAQTUAQ	IMAGRUAQ LAKE.	THIS LAKE HAS DRIED UP AND IS A MUDDY SWAMP. HUNTING AREA.
TLUITES044		QIMIBABRUQAQ	NAME GIVEN TO THE HIGH RIDGES.	HUNTING/TRAPPING AREA.
TLUITES045		TUQDUK		FISHING/HUNTING AREA.
TLUITES047		NANUBAQ TALIK		FISHING, HUNTING, NESTING AREA.
TLUITES048		MAYUBIAM KUUWA, MIGUAKIAK RIVER	MAYUGIAQ (TO CLIMB OR CLIMB UP) RIVER.	PART OF AN INLAND ROUTE TO THE EAST.
TLUITES049		PIQQIM QIMIBAWIOOI	PIQQIQ HILLS.	HUNTING/NESTING AREA.
TLUITES050		NIBLIBAAM PAAWA	ENTRY/MOUTH OF NIGLIGAAQ (GOOSE) CREEK.	SUMMER FISHING, HUNTING, GOOSE NESTING AREA.
TLUITES051		NIBLIBAAM KUUBUURAWA	NIGLIGAAQ (GOOSE) CREEK.	SUMMER FISHING, HUNTING, GOOSE NESTING AREA.
TLUITES052		SUQDAK, SUQDAIT		SOD HOUSE RUINS, ICE CELLARS. FISHING, TRAPPING, CARIBOU HUNTING AREA, NESTING AREA.
TLUITES054		KIMMITQUM KAWIQFUA	KIMMITQUQ BEND.	FISHING, TRAPPING, HUNTING AREA.
TLUITES055		AKDABAALUK	WHERE BROWN BEARS ROAM.	CABINS. FISHING, CARIBOU HUNTING, GEESE NESTING AREA.
TLUITES056		PIQQIM NARVAWA	PIQQIQ LAKE.	FISHING/HUNTING AREA.
TLUITES057		PIWUTUUM PAAWA	ENTRY/MOUTH OF THE PINGUTUUQ (PINGOS FOUND ALONG THE RIVER BANK) RIVER.	HUNTING/FISHING AREA.
TLUITES058		PIQQIQ		HUNTING AREA.
TLUITES059		PIWUTUUM KUUWA	PINGUTUUQ (PINGOS FOUND ALONG THE RIVER BANK) RIVER.	HUNTING/FISHING AREA.
TLUITES060		QAUQTUM PAAWA	ENTRY/MOUTH OF QAUQTUQ LAKE.	FISHING, FOX TRAPPING, CARIBOU HUNTING AREA.



TLUI	TLUI (OLD)¹	TLUI NAME	TRANSLATION	DESCRIPTION
TLUITES061		IKSUBVIUM QIKIQTAWA	IKSUGVIK ISLAND.	FISHING, TRAPPING, HUNTING AREA.
TLUITES062		QAUQTUM NARVAWA	QAUQTUQ LAKE.	FISHING, FOX TRAPPING, CARIBOU HUNTING AREA.
TLUITES063		MASRIIN		FISHING/HUNTING AREA.
TLUITES064		IKSUBVIK	IKSUGVIK	MARKS SHOWING WHERE/HOW FAR COMPETITORS JUMPED DURING INUPIAT GAMES. FISHING, TRAPPING, HUNTING AREA.
TLUITES065		IKSUBVIUM KUUWA	IKSUGVIK RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUITES066		TUPQUTAAM KUUWA	TUPQUTAAQ RIVER.	FISHING, TRAPPING HUNTING AREA.
TLUITES067		KUYAPIGAM NUVUA	KUYAPIGAQ POINT.	FISHING, TRAPPING HUNTING AREA.
TLUITES068		KUYAPIGAQ		FISHING, TRAPPING, HUNTING AREA.
TLUITES069		QIKIQTAAQ	AN ISLAND.	HUNTING, FISHING, TRAPPING AREA.
TLUITES070		KIGEAVAIT NUVUA	KIGLAVAIT POINT.	HUNTING AREA.
TLUITES071		KIGEAVAIT IOITUBLIA		RUINS. HUNTING, CAMPING AREA.
TLUITES072		KIGEAVAIT KUUWA	KIGLAVAIT RIVER.	FISHING/HUNTING AREA.
TLUITES073		PIWUBRUK	PINGUGRUK RIVER.	FISHING/HUNTING AREA.
TLUITES074		KUUPADDUK	A BAD RIVER.	LONG AGO, INUPIAT PEOPLE CAMPED AT THIS SITE AND WERE ATTACKED BY INDIANS.
TLUITES075		IKPIKPAGRUAM KUUWA KIVALLIQ	EAST IKPIKPAGRUQAQ (LARGE FOOTHILLS) RIVER.	FISHING, TRAPPING, HUNTING ALONG THE RIVER.
TLUITES077		IKPIKPAGRUAM KUUWA KIVALLIQ	EAST IKPIKPAGRUQAQ (LARGE FOOTHILLS) RIVER.	FISHING, TRAPPING, HUNTING ALONG THE RIVER.
TLUITES078		PIWUGRUUM PAAWA	ENTRY/MOUTH OF THE PINGUGRUK (HIGH MOUND/HILL) RIVER.	FISHING, TRAPPING, CARIBOU HUNTING AREA.
TLUITES079		PITTABRUQAQ	PITTAGRUAQ LAKE.	CARIBOU PASS THROUGH THIS LAKE DURING THEIR ANNUAL MIGRATION.
TLUITES080		PIWUBRUUM KUUWA	PINGUGRUK (HIGH MOUND/HILL) RIVER.	FISHING, TRAPPING, CARIBOU HUNTING AREA.
TLUITES082		SIBVAN		DOVE (100+ FT ABOVE SEA LEVEL). IMPORTANT LANDMARK FORMS PART OF THE RIDGE SYSTEM (QUAGRUGAGRUAQ).
TLUITES083		TABBAQ	A SHADOW OR REFLECTION (E.G., A MIRROR).	ROUND BLUFF WITH OPENING ON ONE END - NATURAL CORRAL USED BY REINDEER HERDERS.
TLUITES084		IKPIKPAGRUAM KAYYAAK	TES	MAJOR HUNTING, FISHING, TRAPPING AREA.



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUITES085		IEAVGAWALUK	PLACE NAME DERIVED FROM A PERSON.	OLD RUINS (E.G., CELLAR, SOD HOUSE). FISHING AREA.
TLUITES086		TAQTU	PLACE NAME DERIVED FROM A PERSON.	DOMES (160+ FT ABOVE SEA LEVEL). IMPORTANT LANDMARK.
TLUITES087		KIGALASAK		HUNTING/CAMPING AREA.
TLUITES088		ISULIUMANIQ		CARIBOU CROSSING AREA
TLUITES089		AQSHO	PLACE NAME DERIVED FROM A PERSON.	DOMES (150+ FT ABOVE SEA LEVEL).
TLUITES090		NUISATCHIQ	NUISATCHIQ HILL.	MOSQUITOES DURING THE SUMMER - CARIBOU MIGRATION ROUTE. HUNTING AREA.
TLUITES091		ASUAQ		HISTORIC CAMP SITE. FISHING, HUNTING, CAMPING, BLUEBERRY HARVEST AREA.
TLUITES092		QIUKKAM IMAWA	PLACE NAME DERIVED FROM A PERSON.	HUNTING AREA.
TLUITES094		UBVIK	A PLACE TO TURN A BOAT UPSIDE DOWN AND LEAN IT AGAINST SOMETHING.	LANDMARK (FOUR CORNERS OF A HILL). HISTORIC REMAINS. FISHING AREA (BROAD WHITEFISH AND GRAYLING). TRAPPING AREA.
TLUITES095		IBIOBAATKUT IOITUBLIA		OLD RUINS. FISHING, TRAPPING, CARIBOU/GEESSE HUNTING AREA.
TLUITES096		AYABAAT, AYAQHAAT	AYAGAAT AND AYAQHAAT LAKES.	FISHING, CARIBOU/GEESSE HUNTING AREA.
TLUITES097		AKIQPAK		CAMPING SITE, POSSIBLE BURIAL SITE. PEOPLE WINTERED HERE IN THE PAST. FISHING, TRAPPING, HUNTING AREA.
TLUITES099		ULUABRUUM NATIBNAWA	ULUAGRUK FLATLAND.	HUNTING AREA. GOOSE FEEDING GROUNDS.
TLUITES100		QIATUNA	QIATUNA LAKE.	FISHING/HUNTING AREA.
TLUITES101		ITVLIJURAQ	A SMALL CROSSING AREA.	FISHING/HUNTING AREA.
TLUITES102		ULUABRUK		CABIN (NSB DWM). FISHING, TRAPPING, CARIBOU/GOOSE HUNTING AREA.
TLUITES103		QAVIARAT	FINE SAND.	OLD NARL CABIN. GOOSE HUNTING AREA. FISHING, TRAPPING, HUNTING AREA.
TLUITES104		ABNAQSAQ	AGNAQSAQ LAKE.	FISHING/HUNTING AREA.
TLUITES105		KUVRABLIQ	A PLACE TO PUT OUT A FISH NET.	FISHING/HUNTING AREA.
TLUITES106		QAVIARAT NUVUA	QAVIARAT (FINE SAND)	FISHING, TRAPPING,



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
			HILL.	HUNTING AREA.
TLUITES107		KIMMITQUM KUUBUURAWA	KIMMITQUQ CREEK.	FISHING, TRAPPING, HUNTING AREA.
TLUITES108		QAVIARAT	FINE SAND.	FISHING/HUNTING AREA.
TLUITES109		AMIEBUBRUAM NUVUA	AMILGUGRUAQ POINT.	HUNTING AREA.
TLUITES110		SIWIGRUAQ	SINGIGRUAQ POINT.	FISHING/HUNTING AREA.
TLUITES111		AMIEBUBRUAQ		HUNTING AREA.
TLUITES112		KUUGAALBIT		FISHING/HUNTING AREA.
TLUITES113		ISUA	THE END OF SOMETHING.	HUNTING AREA.
TLUITES114		SIWIBRUAM AKIEEIA, MAURVIUM NUVUA, TAGLIM NUVUA	MAURVIK AND TAGLI POINT. SECOND SINGIGRUAQ POINT.	FISHING, GEESE/CARIBOU HUNTING AREA.
TLUITES115		TAGLIM PAAWA	ENTRY/MOUTH OF THE TAGLI RIVER.	FISHING (BROAD WHITEFISH, LEAST CISCO, LAKE TROUT/CHAR), GEESE/CARIBOU HUNTING AREA.
TLUITES116		QIMMIT NALLUATA PAAWA	QIMMIT NALLUAT RIVER ENTRY/MOUTH.	FISHING/HUNTING AREA.
TLUITES117		TAGLI		FISHING (BROAD WHITEFISH, LEAST CISCO, LAKE TROUT/CHAR), CARIBOU/GEESE HUNTING AREA. FISHING TRAIL.
TLUITES118		QIMMIT NALLUATA KUUWA	QIMMIT NALLUAT RIVER.	FISHING, TRAPPING/HUNTING AREA.
TLUITES119		NIEEUVIK		FISHING/HUNTING AREA.
TLUITES120		SAQDAK	TO HOLLER OR YELL.	FISHING/HUNTING AREA.
TLUITES121		ALABIM NUVUA UALLIQ	WEST ALAGI POINT.	HUNTING AREA.
TLUITES122		ALABIMLU UYABALIUMLU NUVUA	ALAGI AND UYAGALIK POINT.	HUNTING AREA.
TLUITES123		NIAQUQTUABRUUM		HUNTING AREA.
TLUITES124		QAYAUVIUM KUUWA	QAYAUVIK RIVER.	FISHING/HUNTING AREA.
TLUITES125		UYABALIGUM NUVUA	UYAGALIK POINT.	FISHING/HUNTING AREA.
TLUITES126		ALABIM KAWIQFUA	ALAGI BEND.	FISHING/HUNTING AREA.
TLUITES127		UYABALIGUM IEULIAWA	UYAGALIK BAY.	FISHING/HUNTING AREA.
TLUITES128		QAYAUVIK	PLACE TO GO BOATING WITH A QAYAQ.	FISHING/CARIBOU HUNTING AREA.
TLUITES129		MAURVIUM KUUWA	MAURVIK RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUITES130		MAURVIUM IEULIAWA	MAURVIK BAY.	FISHING/HUNTING AREA.
TLUITES131		MAURVIUM IGLUBRAUWI		RUINS. FISHING, TRAPPING, CAMPING, HUNTING AREA.
TLUITES132		TAGLI		FISHING (BROAD WHITEFISH, LEAST CISCO, LAKE TROUT), CARIBOU/GEESE HUNTING AREA. FISHING TRAIL.



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUITES133		UYABALIK		CABIN, SOD HOUSE RUINS, ICE CELLAR. FISHING, TRAPPING, HUNTING AREA.
TLUITES134		UYABALIGUM KUUWA	UYAGALIK RIVER.	FISHING/HUNTING AREA.
TLUITES135		ALABI		OLD RUIN. SHAMAN STORY. FISHING/HUNTING AREA.
TLUITES136		KAYYAAK	SPLIT BETWEEN RIVERS.	FISHING, TRAPPING, HUNTING AREA.
TLUITES137		KAMA		OLD GRAVE. FISHING/HUNTING AREA.
TLUITES138		UYABALIGUM NARVAWA	UYAGALIK LAKE.	FISHING AREA.
TLUITES139		KAMAM NARVAWA	KAMA LAKE.	FISHING/HUNTING AREA.
TLUITES140		TAGLIM SAQUUBUUTAA	A BEND IN THE TAGLI RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUITES141		TAGLIM SAQUUBUUTAA	A BEND IN THE TAGLI RIVER.	FISHING, TRAPPING, HUNTING AREA.
TLUITES142		TAGLI		FISHING (BROAD WHITEFISH, LEAST CISCO, LAKE TROUT), CARIBOU/GEESE HUNTING AREA. FISHING TRAIL.
TLUITES143		NALLUBRUAQ	NALLUGRUAQ SAND DUNES.	CARIBOU/GEESE HUNTING AREA.
TLUITES144		ANABI	ANAGI LAKE.	FISHING AREA.
TLUITES145		TAGLI		FISHING (BROAD WHITEFISH, LEAST CISCO, LAKE TROUT/CHAR), CARIBOU/GEESE HUNTING AREA. FISHING TRAIL.
TLUITES146		NALLUBRUAQ	NALLUGRUAQ SAND DUNES.	CARIBOU/GEESE HUNTING AREA.
TLUITES147		SIGGUYUGRUAQ	SIGGUYUGRUAQ LAKE.	FISHING, CARIBOU/GEESE HUNTING AREA.
TLUITES148		TAKKAUM IOITUBLIA	PLACE NAME DERIVED FROM A PERSON.	SOD HOUSE RUINS. REINDEER CORRAL. FISHING, CARIBOU, GEESE HUNTING AREA.
TLUITES149		QIWAQTAM IOITUBLIA	PLACE NAME DERIVED FROM A PERSON.	SOD HOUSE RUINS. FISHING, CARIBOU/GEESE HUNTING AREA.
TLUITES150		UVLUTUUQ	UVLUTUUQ RIVER.	FISHING, CARIBOU, GEESE HUNTING AREA.
TLUITES151		UVLUTUUQ	UVLUTUUQ RIVER.	FISHING, CARIBOU AND GEESE HUNTING AREA.
TLUITES152		INIKAAK	INIKAAK RIVER.	PILE OF ANTLERS. FISHING, TRAPPING, CARIBOU/GEESE HUNTING AREA.
TLUITES202		IMABRUAM IKPIGRUAWA	IMAGRUAQ HILL.	HUNTING AREA.
TLUITES205		IMABRUAM PAAWA	ENTRY/MOUTH OF THE IMAGRUAQ RIVER.	THIS RIVER HAS DRIED UP. OLD HUNTING/FISHING AREA.
TLUITES207		NUNAM ISUA		HUNTING AREA.
TLUITES208		IPIIQAUN		FISHING, HUNTING, NESTING AREA.



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUITES211		IMABRUAM KUUWA	IMAGRUAQ RIVER.	THS RIVER HAS DRIED UP. HUNTING AREA.
TLUITES212		AMIEBUGIIK		FISHING/HUNTING AREA.
TLUITES215		NALLUQ		HUNTING AREA.
TLUITES216		AYAGUTAQ		HUNTING AREA.
TLUITES217		NALLUABRUUM PAAWA	ENTRY/MOUTH OF THE NALLUAGRUK RIVER.	FISHING/HUNTING AREA.
TLUITES218		SISAMALIK		HUNTING AREA.
TLUITES219		KUUGRUAGAABRUK		FISHING/HUNTING AREA.
TLUITES220		TASIABRUK		FISHING/HUNTING AREA.
TLUITES222		QALLUVIK		STANDING/COLLAPSED HOUSES, 2 WHALE BOATS. LARGE POPULATION (1930s).
TLUITES223		QIMIGAYUK	NAME REFERS TO THE FOOTHILLS.	FISHING/HUNTING AREA.
TLUITES225		NATIBNAURAQ	SMALL FLAT LAND.	HUNTING AREA.
TLUITES226		KIWIOWUQ		HUNTING AREA.
TLUITES227		QIRUKTABIAQ	A PLACE TO GO COLLECT DRIFTWOOD FOR SHELTER/FUEL.	HUNTING AREA.
TLUITES229		IGLUQABVIALUK		OLD HOUSES. FISHING/HUNTING AREA.
TLUITES230		TIGUTAAM PAAWA	ENTRY/MOUTH OF THE TIGUTAAQ RIVER.	FISHING/HUNTING AREA.
TLUITES232		QAGGAQ	QAGGAQ LAKE.	FISHING/HUNTING AREA.
TLUITES233		KUVRABLIQ	PLACE TO PUT OUT NET.	FISHING/HUNTING AREA.
TLUITES235		NALUABRUUM KUUWA	NALLUAGRUK RIVER.	FISHING/HUNTING AREA.
TLUITES236		MITITUAM KUUBUURAWA	MITITUAQ CREEK.	FISHING/HUNTING AREA.
TLUITES237		KIOAVIAQ	PLACE NAME DERIVED FROM A PERSON.	OLD HUNTING/CAMPING AREA.
TLUITES238		TIGUTAAM KUUWA	TIGUTAAQ RIVER.	FISHING/HUNTING AREA.
TLUITES239		NALLUABRUK AWMALUAQTUAQ	NALLUAGRUK LAKE.	LAKE HAS DRIED UP AND IS A MUDDY SWAMP. HUNTING AREA.
TLUITES240		NALLUABRUK	NALLUAGRUK LAKE.	FISHING/HUNTING AREA.
TLUITES241		AKUVAAM IOITUBLIA	PLACE NAME DERIVED FROM A PERSON.	SOD HOUSE RUINS. FISHING, HUNTING AREA.
TLUITES242		UQALIK	WITH A TONGUE.	FISHING/HUNTING AREA.
TLUITES243		YUGAARIQ	PLACE NAME DERIVED FROM A PERSON.	GRAVE SITE. HUNTING AREA.
TLUITES244		TIGUTAAQ	TIGUTAAQ LAKE.	FISHING/HUNTING AREA.
TLUITES245		IMABRUQAQ	BIG WATER.	OLD SOD HOUSES (ERODED), GRAVE.
TLUITES246		IGLIBAQ	IGLIGAQ LAKE.	FISHING, TRAPPING, HUNTING AREA.
TLUITES247		NARVAQ	LAKE.	FISHING/HUNTING AREA.
TLUITES249				NO DATA
TLUITES250				NO DATA
TLUITES251				NO DATA
TLUITES252				NO DATA



TLUI	TLUI (OLD) <sup>1</sup>	TLUI NAME	TRANSLATION	DESCRIPTION
TLUITES253				NO DATA
TLUITES254				NO DATA
TLUIUMI002				NO DATA
TLUIUMI005				NO DATA
TLUIUMI008				NO DATA

<sup>1</sup> Many TLUI sites have identifying numbers from two different number systems: one used in the 1970s (TLUI [old]) (Hoffman et al. 1988) and one developed later (North Slope Borough 2003).

Sources: Hoffman, D., D. Libbey, and G. Spearman. 1988. *Nuiqsut: Land Use Values Over Time in the Nuiqsut Area*. North Slope Borough and the Anthropology and Historic Preservation Section of the Cooperative Park Studies Unit Occasional Paper No. 12. University of Alaska, Fairbanks, Alaska; NSB. 2003. Unpublished Subsistence Survey Data. North Slope Borough, Division of Wildlife Management, Barrow, Alaska.







## **Appendix J: BLM Sensitive Species List for Alaska**







## Appendix J

### BLM Sensitive Species List for Alaska

Common Name	Scientific Name
PLANTS	
Alaska bluegrass	<i>Poa hartzii alaskana</i>
Alaskan glacier buttercup	<i>Beckwithia glacialis</i> spp. <i>alaskensis</i>
Aleutian saxifrage	<i>Saxifraga aleutica</i>
Aleutian whitlow-grass	<i>Draba aleutica</i>
Aleutian wormwood	<i>Artemisia aleutica</i>
Alpine draba	<i>Draba micropetala</i>
Arctic locoweed	<i>Oxytropis arctica</i> var. <i>barnedyana</i>
Bering dwarf primrose	<i>Douglasia beringensis</i>
Calder's bladderpod	<i>Lesquerella calderi</i>
Calder's licorice-root	<i>Ligusticum calderi</i>
Drummond's bluebell	<i>Mertensia drummondii</i>
Hairy lousewort	<i>Pedicularis hirsuta</i>
Kobuk locoweed	<i>Oxytropis kobukensis</i>
Moonwort	<i>Botrychium ascendens</i>
Mountain avens	<i>Senecio moresbiensis</i>
Muir's fleabane	<i>Erigeron muirii</i>
Murray's whitlow-grass	<i>Draba murrayi</i>
Narrow-leaved prairie rocket	<i>Erysimum asperum</i> var. <i>angustatum</i>
Nodding semaphoregrass	<i>Pleuropogon sabinei</i>
Ogilvie Mountains springbeauty	<i>Claytonia ogilviensis</i>
Ogilvie Mountains whitlow-grass	<i>Draba ogilviensis</i>
Pear-shaped candytuft	<i>Smelowskia pyriformis</i>
Purple wormwood	<i>Artemisia globularia</i> var. <i>lutea</i>
Pygmy aster	<i>Aster pygmaeus</i>
Sessile-leaved scurvy grass	<i>Cochlearia sessilifolia</i>
Shacklette's catseye	<i>Cryptantha shackletteana</i>
Stipulated cinquefoil	<i>Potentilla stipularis</i>
Tundra whitlow-grass	<i>Draba kananaskis</i>
Willow	<i>Salix reticulata</i> spp. <i>glabellcarpa</i>
Yellow-ball wormwood	<i>Artemisia senjavinensis</i>
Yukon podistera	<i>Podistera yukonensis</i>
Yukon wild buckwheat	<i>Eriogonum flavum</i> var. <i>aquilinum</i>



Common Name	Scientific Name
<b>FISH</b>	
Angayukaksurak char	<i>Salvelinus anaktuvukensis</i>
Beaver Creek chinook salmon	<i>Oncorhynchus tshawytscha</i>
Clear Creek chum salmon	<i>Oncorhynchus keta</i>
Gulkana steelhead	<i>Oncorhynchus mykiss</i>
Kigliak char	<i>Salvelinus alpinus</i>
Western brook lamprey	<i>Lampetra richardsoni</i>
<b>BIRDS</b>	
Black brant	<i>Branta bernicla</i>
Black guillemot	<i>Cepphus grylle</i>
Black scoter	<i>Melanitta nigra</i>
Blackpoll warbler	<i>Dendroica striata</i>
Black-tailed godwit	<i>Limosa limosa</i>
Bristle-thighed curlew	<i>Numenius tahitiensis</i>
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>
Dovekie	<i>Alle alle</i>
Dusky Canada goose	<i>Branta canadensis occidentalis</i>
Gray-cheeked thrush	<i>Catharus minimus</i>
Harlequin duck	<i>Histrionicus histrionicus</i>
King eider	<i>Somateria spectabilis</i>
Kittlitz's murrelet	<i>Brachyramphus brevirostris</i>
Long-tailed duck	<i>Clangula hyemalis</i>
Marbled godwit	<i>Limosa fedoa</i>
Marbled murrelet	<i>Brachyramphus marmoratus</i>
McKay's bunting	<i>Plectrophenax hyperboreus</i>
Northern goshawk (Queen Charlotte)	<i>Accipiter gentilis laingi</i>
Olive-sided flycatcher	<i>Contopus cooperi borealis</i>
Red knot	<i>Calidris canutus</i>
Red-throated loon	<i>Gavia stellata</i>
Surf scoter	<i>Melanitta perspicillata</i>
Townsend's warbler	<i>Dendroica townsendi</i>
Trumpeter swan	<i>Cygnus buccinator</i>
Tule white-fronted goose	<i>Anser albifrons gambelli</i>
Yellow-billed loon	<i>Gavia adamsii</i>
<b>MAMMALS</b>	
Canada lynx	<i>Lynx canadensis</i>
Harbor seal	<i>Phoca vitulina concolor</i>



## **Appendix K: Information, Models, and the Assumptions Used to Analyze the Effects of Oil Spills**







## Appendix K

### Information, Models, and the Assumptions Used to Analyze the Effects of Oil Spills

#### TABLE OF CONTENTS

K.1.	Oil Spill Size Categories .....	K-3
	K.1.1 Probability of a Large Crude Oil Spill.....	K-4
	K.1.2. Probability of a Small Crude Oil Spill - Less Than 500 Barrels .....	K-9
	K.1.3 Probability of a Very Large Oil Spill - Greater Than or Equal to 120,000 Barrels .....	K-11
K.2.	Oil Weathering and Spreading.....	K-11
	K.2.1. Modeling Simulations of Oil Weathering.....	K-11
	K.2.2. Observations of Historic North Slope Spill Patterns.....	K-13
K.3.	Cumulative Analysis of Oil Spills .....	K-14
	K.3.1. Preparing the Cumulative Analysis.....	K-14
	K.3.2. Estimating Possible Future Spills From All Sources .....	K-14
K.4.	Bibliography .....	K-17

#### List of Tables

K-1.	Oil Spill Scenario Assumptions for the Alternatives .....	K-4
K-2.	Large Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve - Alaska .....	K-8
K-3.	Small Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska .....	K-10
K-4.	Small Refined Oil Spills <500 bbl Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska.....	K-11
K-5.	Fate and Behavior of a Hypothetical 500 bbl Oil Spill From Lagoon Pipelines .....	K-12
K-6.	Fate and Behavior of a Hypothetical 900 bbl Oil Spill From a Lagoon Facility .....	K-13
K-7.	Oil Spill Rates and Spill-size Categories Used to Estimate Large Crude Oil Spills for the Cumulative Analysis .....	K-14
K-8.	Cumulative Oil-Spill-Occurrence Estimates $\geq 500$ bbl and $\geq 1,000$ bbl over Assumed 15-20 Year Production Life of the Northeast National Petroleum Reserve – Alaska...	K-16







## APPENDIX K

# INFORMATION, MODELS, AND ASSUMPTIONS USED TO ANALYZE THE EFFECTS OF OIL SPILLS

This Supplement to the Amended IAP/EIS analyzes oil spills, and their potential impacts to environmental, economic, and sociocultural resources and resource areas, which could result from onshore oil exploration and development in the Northeast National Petroleum Reserve – Alaska (NPR-A). Predicting an oil spill is an exercise in probability. There is uncertainty associated with the location, number, and size of oil spills, the chemistry of the oil, and the environmental conditions at the time of a spill. Although some of the uncertainty reflects incomplete or imperfect data, there is also a considerable amount of uncertainty involved in predicting events 15 to 25 years into the future. However, the chance of an oil spill occurring can be estimated using historical data.

Assumptions about oil spills are used to analyze the effects of oil spills. These assumptions pertain to the type of oil, the source of an oil spill, the general location and size of a spill, the chemistry of the oil, how the oil will weather, how long the oil will remain, and where the oil will go. Project-specific information, statistical analysis, and professional judgment support the assumptions. Based on these assumptions, a scenario is created to reflect a spill, and the effects of such a spill are analyzed. These steps constitute a “what if a spill occurs” analysis.

This oil spill analysis considers the entire production life of the planning area, and assumes that commercial quantities of hydrocarbons are present in the planning area and that these hydrocarbons will be developed and produced at the estimated resource levels presented in the Supplemental IAP/EIS. Uncertainties exist, such as 1) the actual resource levels, 2) the actual size of a crude or refined oil spill, 3) the approximate location of oil assumed to be produced, and 4) whether production would occur at all. If no hydrocarbons exist, there is no chance of a crude oil spill occurring in the planning area.

### K.1 Oil Spill Size Categories

This Supplement analyzes what is likely to happen in the future, using assumptions about the likely size, duration, and type of a spill to analyze the effects. To estimate these parameters, oil spills are divided into two types: crude oil and refined oil spills. Crude oil spills are divided into three size categories: small, large, and very large. Within each of these categories, generalized and specific assumptions are made. Refined spills fall into the small spill size category.

Small spills are defined as those less than 500 barrels (bbl; 1 bbl = 42 gallons); large spills are greater than or equal to 500 bbl or 1,000 bbl (depending upon the data source); and very large spills are greater than or equal to 120,000 bbl. Table K-1 shows the assumed source of a spill(s), type of oil, size of spill(s) in bbl, and the receiving environment that is assumed in the analysis of the effects of oil spills in this Supplement. The effects of spill(s) are analyzed in Chapter 4 (Environmental Consequences). The following sections discuss the oil spill analysis, and the assumptions used for analysis, for each of these three size categories.



### K.1.1 Probability of a Large Crude Oil Spill

Large spills are defined as greater than or equal to 500 bbl for the Alaska North Slope and Trans-Alaska Pipeline System (TAPS), and greater than or equal to 1,000 bbl for the TAPS tankers. Historical information about previous large spills on the Alaska North Slope, from TAPS, and from TAPS tankers was used to estimate the hypothetical size of large spills and the rate at which such large spills would be expected to occur in the future.

**Table K-1. Oil Spill Scenario Assumptions for the Alternatives**

Source of Spill	Type of Oil	Size of Spill (bbl)	Assumed Number of Spills Under Each Alternative				Receiving Environment
			A	B	C	D	
Small Spills (< 500 bbl) Onshore and Offshore							
Operational spills from all sources	Crude	3	561	596	721	659	Ice, tundra, snow, gravel pad, and water
	Refined	0.7	1,276	1,474	1,782	1,628	
Large Spills (≥ 500 bbl) Onshore or Offshore							
Pipeline	Crude	4,800	2	3	3	3	Ice, tundra, snow, gravel pad, and water
Platform/gravel pad	Crude	900					
Storage tank/gravel pad	Diesel	900					
Very Large Spills (≥ 120,000 bbl)							
Well blowout	Crude	120,000	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Ice, tundra, snow, gravel pad, and water

#### K.1.1.1 Historical Large Crude Oil Spill Sizes

Assumptions for large spills from production in the planning area are based on the historic spill sizes from onshore Alaska North Slope oil industry spills from 1985 to 2000, TAPS spills from 1977 to 2001, and TAPS tanker spills from 1977 to 1999. Additional consideration is given to the large spill that occurred in March 2006 known as the GC-2 Oil Transit Line Release.

#### Historical Crude Oil Spills Greater Than or Equal to 500 Barrels on the North Slope

The Alaska North Slope oil spill analysis includes onshore oil and gas exploration and development spills from the Point Thompson Unit, Badami Unit, Kuparuk River Unit, Milne Point Unit, Prudhoe Bay West Operating Area, Prudhoe Bay East Operating Area, and offshore Duck Island Unit (Endicott). Alaska North Slope data include spills from onshore pipelines and offshore and onshore production and gathering facilities. The following information does not include spills on the Alaska North Slope from the TAPS, which were evaluated separately.

For the Alaska North Slope, all available information on historic spills greater than or equal to 100 bbl during the period 1968 through 2000 was obtained from industry and regulatory agencies and collated (Anderson and LaBelle 2000, Hart Crowser, Inc. 2000). Information on the 2006 GC-2 Oil Transit Line Release came from Situation Reports posted on the Alaska Department of Environmental Conservation website. The USDOJ MMS and Hart Crowser, Inc.



collected data for crude oil spills for the U.S. Beaufort Sea, the NPR-A, and Onshore Alaska North Slope east of the NPR-A from the following sources:

- British Petroleum (BP) Exploration (Alaska), Inc., electronic database files of oil spills in the Prudhoe Bay Unit Western Operating Area (1989 through 1996), Duck Island (Endicott) Unit (1989 through 1996), and Milne Point (1994 through 1996).
- BP Exploration (Alaska), Inc., electronic spreadsheet containing all industry and contractor oil spills from January 1997 to May 2001.
- Atlantic Richfield Company (ARCO) electronic spreadsheet files of oil spills for the Prudhoe Bay Unit Eastern Operating Area (1977 through 1996), Kuparuk River Unit (1977 through 1985 and 1986 through 1996), and Kuparuk River Unit exploration (1986 through 1996).
- Alyeska printed summary report of oil spills greater than 1,000 bbl along the TAPS from 1977 through 1989.
- Joint Pipeline Office electronic database of oil spills along the TAPS (1970 through 1994).
- Bureau of Land Management (BLM) printed reports of oil spills along the TAPS during 1981 and 1982.
- Alaska Department of Environmental Conservation (ADEC) electronic text and spreadsheet files of oil spills from the agency's current oil and hazardous substances spill database (July 1995 through February 1997) and an earlier oil and hazardous substances spill database (1971 through July 1995).
- Alaska Department of Environmental Conservation electronic spreadsheet containing all oil spills in their current oil and hazardous substance spill database to December 2000.
- An unattributed printed summary of oil spills over 100 gallons on the Alaska North Slope and along the TAPS from 1970 through 1981.
- An electronic spreadsheet summary of Alaskan and Canadian oil spills of 100 bbl or greater, from 1978 through 2000, as reported by the Oil Spill Intelligence Report.
- An MMS report that no oil spills of 100 bbl or larger have occurred in the Alaska Outer Continental Shelf Beaufort or Chukchi sea(s) study area.
- Alyeska electronic spreadsheet file containing all oil spills of 100 bbl or larger from the company's oil-spill database to September 1999.

A review of the reliability and completeness of the data for spills greater than or equal to 500 bbl (Hart Crowser, Inc. 2000) indicates that the available information was most reliable for 1985 through 2000, based on written documentation or lack of documentation and spills before that period. The MMS determined that spills greater than or equal to 100 bbl were documented and included in the database since 1985. In 1985, the ADEC began tracking spills in an electronic format. Although Hart Crowser, Inc. (2000) states that the database is complete for the years since production began, the BLM prefers to use 1985 as the starting point of reliability. Any uncertainty in documenting spills before that time is a concern because it is typical for spills to occur more frequently during field and pipeline startup.

Six crude oil spills greater than or equal to 500 bbl associated with onshore or offshore Alaska North Slope oil production occurred from 1985 to 2000. No spills greater than or equal to 1,000 bbl were documented during this time period. Of the six spills, one (i.e., a leak in either a 20- or 24-inch flow line from the wells in Kuparuk to the Central Processing Facility) is classified as a pipeline spill. The other five spills are classified as facility spills. The 2006 spill was from a 34



inch crude oil transit pipeline with an estimated volume of 201,000 gallons, +/- 33%, or 4800 bbls +/- 33%.

From 1985 to 2000, the median facility spill greater than or equal to 500 bbl on the Alaska North Slope was 663 bbl, and the mean (or average) was 680 bbl. The one pipeline spill had a volume of 510 bbl. For spill analysis, the largest recorded facility spill is used. The largest facility spill on record is 925 bbl. This oil spill analysis uses a pipeline spill of 4800 bbl. Rounded to the nearest 100 (to reflect the uncertainty associated with spill estimates), the hypothetical spill sizes become 900 bbl for the facility spill and 4800 bbl for the pipeline spill.

### **Historical Crude Oil Spills Greater Than or Equal to 500 Barrels From the Trans-Alaska Pipeline**

The TAPS oil-spill analysis includes the pipeline and the pump stations, but excludes the Valdez marine terminal. Eight crude oil spills greater than or equal to 500 bbl associated with TAPS occurred from 1977 through 2001. Most large crude oil spills were associated with the start-up of the pipeline. No large spills greater than or equal to 1,000 bbl occurred from 1981 to 2000. On October 4, 2001, a bullet punctured the 48-inch TAPS mainline; approximately 6,800 bbl of crude oil were released from this intentional sabotage. Using the highest reported spill-quantity values, the mean (average) recorded crude oil spill greater than or equal to 500 bbl from 1977 to 2001 is 5,462 bbl, and the median is 4,381 bbl. Using the Alyeska Pipeline Service Company reported values, the mean and median spill sizes are 4,089 and 1,650, respectively. For spill analysis, the highest reported spill quantity mean is used and rounded to the nearest 100. Therefore, the mean hypothetical TAPS spill size is 5,500 bbl (median 4,400 bbl) for this oil spill analysis.

### **Historical Crude Oil Spills Greater Than or Equal to 1,000 Barrels from Tankers**

Eleven crude oil spills greater than or equal to 1,000 bbl associated with the TAPS tankers have occurred from 1977 to 1999. The mean size for all TAPS tanker spills is 27,000 bbl and the median is 5,000 bbl. For in-port spills, the mean and median are 5,600 bbl and 5,300 bbl, respectively. For at-sea spills, the mean and median are 40,600 bbl and 4,900 bbl, respectively. The TAPS tanker spills are smaller than worldwide tanker spills and slightly smaller than tanker spills in U.S. waters (Anderson and Labelle 2000).

### **Historical Crude Oil Spills from Blowouts on the Alaska North Slope**

The record for Alaska North Slope blowouts is not validated, but is presented as the best available information. There are two written reports regarding blowouts on the Alaska North Slope: Mallory (1998) and Fairweather (2000). Fairweather (2000) found 10 blowouts—six that Mallory had identified for the period 1974 to 1998 and four that occurred before 1974. Of the 10 blowouts, nine were gas and one was oil. The 1950 oil blowout was unspectacular and could not have been avoided, as there were no casings or blowout preventors available (Fairweather 2000). Drilling practices from 1950 would not be relevant today. A third study confirmed that no crude oil spills greater than or equal to 100 bbl from blowouts occurred from 1985 through 1999 (Hart Crowser, Inc. 2000). A recent report titled Blowout Frequency Assessment of Northstar (Scandpower AS 2001) uses statistical blowout frequencies modified to reflect specific field conditions and operative systems at Northstar. This report concludes that the blowout frequency for drilling in the oil-bearing zone at Northstar is  $1.5 \times 10^{-5}$  per well drilled. In comparison, the average statistical blowout frequency for a development well in the North Sea and U.S. Gulf of Mexico is  $7.4 \times 10^{-5}$  per well. This same report estimates that the statistical



frequency of a blowout spill with a size greater than 130,000 bbl is  $9.4 \times 10^{-5}$  per well drilled for Northstar.

However unlikely a blowout may be, it is an important concern to the public; therefore, the effects of a 120,000 bbl (15 day) spill are analyzed in **section 4.10** (Low Probability, Very Large Oil Spill).

#### **K.1.1.2 Historical Large Crude Oil Spill Rates**

Oil spill rates are the number of spills that occur over some exposure variable. The exposure variable can be bbl of oil produced or pipeline miles per year. Oil spill rates are estimated for the Alaska North Slope, the TAPS, and the TAPS tankers using historical spill data.

##### **Alaska North Slope Spill Rate 1985-2000 Based on Volume**

Only one Alaska North Slope facility or pipeline spill greater than or equal to 1,000 bbl from Alaska North Slope production has occurred since 1985. No documentation for crude oil spills greater than or equal to 100 bbl occurring prior to 1985 was found, but spill records dated prior to 1985 have not been validated as complete because of missing or incomplete documentation.

As noted above, five facility spills and one pipeline spill are documented from 1985 to 2000 and a large pipeline spill occurred in 2006. Total Alaska North Slope production was estimated to be 9.36 billion barrels (Bbbl) of crude oil and condensate (Alyeska Pipeline Service Company 2001, McMaines 2001). Anderson and LaBelle (2000) calculated Alaska North Slope spill rates from 1985 to 1998, hence they are slightly different from the spill rates calculated, using the 1985 to 2000 information, for this Supplement. The spill rate of 0.53 large spills per Bbbl handled was calculated for Alaska North Slope facility spills, using the entire record of five spills from 1985 to 2000. BLM and MMS use the 1985 to 2000 time period because spills greater than 100 bbl have been documented since 1985. In addition, the ADEC began an electronic database of oil spills in 1985. BLM and MMS consider the database most reliable from 1985 forward. The Alaska North Slope pipeline spill rate of 0.11 large spills per Bbbl handled was based on the record of one pipeline spill from 1985 to 2000. Including the spill in 2006, without considering the increased production that occurred in that additional time period, gives a very conservative figure of 0.22 spills per Bbl handled. The combined large crude oil spill rate for facilities and pipelines is 0.75 spills per Bbbl handled.

##### **Trans-Alaska Pipeline Spill Rate 1977-2001 and 1985-2001 Based on Volume and Pipeline-Mile-Year**

Flow in the TAPS began on June 20, 1977, with throughput of 112 million barrels (MMbbl) by the end of 1977. Throughput increased to almost 400 MMbbl in 1978, peaked at 744 MMbbl in 1988, and was 370 MMbbl in 2001. The estimated total volume transported through the TAPS during the period 1977 through 2001 is 13.62 Bbbl. The TAPS is 800 miles long.

##### **1977-2001**

There have been 12 crude oil spills greater than or equal to 100 bbl attributed to TAPS operation, four of which were less than 500 bbl. Eight spills were greater than or equal to 500 bbl, of which six were greater than or equal to 1,000 bbl. The last spill greater than or equal to 1,000 bbl occurred in 2001. The spill rate for spills greater than or equal to 500 bbl of 0.59 spills per Bbbl transported for TAPS was calculated based on the record of six accidental and two



sabotage spills over 13.62 Bbbl of production. The spill rate of 0.000425 large spills per pipeline-mile-year for TAPS was calculated based on the record of six accidental and two sabotage spills over 18,835 pipeline-mile-years during the period 1977 through 2001.

### 1985-2001

For purposes of this oil spill analysis, approximately the same time period (1985-2001) and the same class size (greater than or equal to 500 bbl) as the Alaska North Slope data in **section K.1.1.1, *Historical Large Crude Oil Spills***, are used. The spill rate of 0.21 large spills per Bbbl transported for TAPS was calculated based on two spills over 9.7 Bbbl of oil transported. The TAPS spill rate is 0.00015 large spills per pipeline-mile-year. The rate was also calculated based on two spills over 13,605 pipeline-mile-years from 1985 to 2001.

### Trans-Alaska Pipeline Tanker Spill Rate 1977-1999 Based on Volume

Eleven tanker spills occurred in association with the transportation of Alaska North Slope crude: the Exxon Valdez spill and 10 other spills less than or equal to 15,000 bbl (Anderson and LaBelle 2000). No large spills have occurred since 1991. The spill rate of 0.87 spills per Bbbl transported was calculated based on the record of 11 accidental spills over 12.6 Bbbl of production (Anderson and LaBelle 2000).

#### K.1.1.3 Estimated Mean Number and Probability of One or More Large Crude Oil Spills for the Northeast National Petroleum Reserve – Alaska

The mean number of large crude oil spills, estimated over the production life of the planning area for Alternative A, Alternative B, Alternative C, and Alternative D are shown in Table K-2. The mean number of spills is derived from the projected resource volumes and the historic spill rate. The estimated total spill volume in Table K-2 is the total volume for all of the spills estimated for the given alternative. For instance, if two spills of 4800 bbl each were likely to occur, then the estimated total spill volume would be 9600 bbl.

**Table K-2. Large Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska**

Alternative	Resources (Bbbl)	Spill Rate (Spills/Bbbl)	Assumed Spill Size (bbl)	Estimated Mean Number of Spills <sup>1</sup>	Estimated Total Spill Volume <sup>2</sup> (bbl)
<b>Crude Oil</b>					
A	2.9	0.75	4,800	2.175	10,440
B	3.35	0.75	4,800	2.513	12,062
C	4.05	0.75	4,800	3.038	14,582
D	3.7	0.75	4,800	2.775	13,320

<sup>1</sup> The estimated mean number of oil spills is based on the estimated resource volume multiplied by the spill rate.  
<sup>2</sup> The estimated total spill volume is the total volume for all of the estimated spills for the given alternative and price of oil.

The projected mean number of spills (listed in Table K-1) is used to estimate the chance of one or more large spills occurring.



### **K.1.2 Probability of a Small Crude Oil Spill - Less Than 500 Barrels**

A total small spill rate of approximately 618 spills per Bbbl handled, calculated from the Alaska North Slope record of small spills, is used here. This spill rate consists of 178 small crude oil spills per Bbl and 440 small refined product spills per Bbbl. Since the companies and regulators that now operate onshore will likely participate onshore in the Northeast NPR-A, it seems reasonable to assume that the spill rate in the Northeast NPR-A will be similar to the rate on the Alaska North Slope.

Historical oil spill information and simple statistical methods are used to derive the following information about small crude and refined oil spills that occur on the Alaska North Slope:

- estimates of how often a spill occurs for every Bbbl of oil produced (oil-spill rates);
- estimates of the mean number of oil spills; and
- estimates of the mean and median size of oil spills from facilities, pipelines, and flow lines combined.

This information is used to estimate the number, size, and distribution of operational small spills that may occur in the planning area.

The historical information consists of crude and refined oil spills reported to the ADEC and the Joint Pipeline Office by the oil industry. Crude and refined oil spill rates and patterns from Alaska North Slope oil and gas exploration and development activities are determined for spills greater than or equal to one gallon and less than 500 bbl. Refined oil includes aviation fuel, diesel fuel, engine lubricants, fuel oil, gasoline, grease, hydraulic oil, transformer oil, and transmission oil. The Alaska North Slope oil spill analysis includes onshore and offshore oil and gas exploration and development spills from the Point Thompson Unit, Badami Unit, Kuparuk River Unit, Milne Point Unit, Prudhoe Bay West Operating Area, Prudhoe Bay East Operating Area, and Duck Island Unit.

Oil spill information is provided to the ADEC by private industry in accordance with State of Alaska Regulations, 18 AAC § 75. The ADEC figures are based on initial spill reports and may not contain updated information. Because of increased scrutiny after the Exxon Valdez oil spill, information in the ADEC database is most reliable for 1989 and later. Even though the integrity of the database cannot be validated thoroughly, the information in the database is still valuable because it is the only available data on small spills. For this oil spill analysis, ADEC records were spot checked against spill records from ARCO Alaska and BP. All spills greater than or equal to one gallon and less than 500 bbl occurring in the 1989 through 2000 time period were included in the oil spill analysis. A simple analysis of operational small oil spills was performed, and spill rates were estimated without regard to differentiating operation processes. The ADEC database structure does not facilitate quantitative analysis of Alaska North Slope oil spill rates separately for platforms, pipelines, or flow lines without further documentation and validation.

#### **K.1.2.1 Historical Small Crude Oil Spill Rates and Patterns on the North Slope**

Because this analysis of crude oil spills was performed collectively for all Alaska North Slope facilities, pipelines, and flow lines, the pattern that emerged was one of numerous small spills. Of the crude oil spills that occurred between 1989 and 2000, the ADEC database indicates that:



- 18% were less than or equal to 1 gallon;
- 54% were less than or equal to 5 gallons; and
- 99% were less than 25 bbl.

The small spill sizes in the database range from less than 1 gallon to 425 bbl. The mean crude oil spill size on the Alaska North Slope is 2.7 bbl, and the median spill size is 5 gallons. For purposes of the oil spill analysis in this Supplement, a mean crude oil-spill size of 3 bbl is assumed for small spills.

The database indicates that the causes of small crude oil spills on the Alaska North Slope, in decreasing order of frequency, are:

- leaks
- faulty valves/gauges
- vent discharges
- faulty connections
- ruptured lines
- seal failures
- human error
- explosions

Approximately 30% of the spills in the database do not include information on the causes.

The estimated small crude oil spill rate for the Alaska North Slope is 178 spills per Bbbl produced. The mean number, size, and total volume of small spills for each of the alternatives are shown in Table K-3. For this oil spill analysis, the mean number of small spills is used as the assumed number of spills.

**Table K-3. Small Crude Oil Spills Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska**

Alternative	Resources (Bbbl)	Spill Rate (Spills/Bbbl)	Assumed Spill Size (bbl)	Estimated Mean Number of Spills <sup>1</sup>	Estimated Total Spill Volume (bbl)
<b>Crude Oil</b>					
A	2.9	178	3	516	1,548
B	3.35	178	3	596	1,782
C	4.05	178	3	721	2,163
D	3.7	178	3	659	1,977

<sup>1</sup> The estimated mean number of oil spills is based on the estimated resource volume multiplied by the spill rate and is rounded to the nearest whole number.

#### **K.1.2.2 Historical Small Refined Oil Spill Rates and Types of Spills on the North Slope**

Typical refined products spilled are aviation fuel, diesel fuel, engine lube, fuel oil, gasoline, grease, hydraulic oil, transformer oil, and transmission oil. On the Alaska North Slope, diesel spills represent 61% of refined oil spills by frequency and 75% by volume. Engine lube oil spills are 10% by frequency and 3% by volume. Hydraulic oil spills are 26% by frequency and 10% by volume. All other categories of spills are less than 1% by frequency and volume. Refined oil



spills occur in conjunction with oil exploration and production, and correlate to the volume of Alaska North Slope crude oil produced. As production of crude oil has declined, so has the number of refined oil spills. However, this apparent relationship could be coincidental, as emphasis on pollution prevention has also increased in the last several years. From 1989 to 2000, the spill rate for refined oil was 440 spills per Bbbl produced.

The mean number of refined oil spills during the lifetime of the alternatives is shown in Table K-8.

**Table K-4. Small Refined Oil Spills <500 bbl Estimated Over the Production Life of the Northeast National Petroleum Reserve – Alaska**

Alternative	Resources (Bbbl)	Spill Rate (Spills/Bbbl)	Assumed Spill Size (bbl) <sup>1</sup>	Estimated Mean Number of Spills <sup>2</sup>	Estimated Total Spill Volume (bbl)
A	2.9	440	0.7	1,276	893
B	3.35	440	0.7	1,474	1,032
C	4.05	440	0.7	1,782	1,247
D	3.7	440	0.7	1,628	1,140

<sup>1</sup> The mean spill size for refined spills on the Alaska North Slope from 1989 through 2000; equivalent to 29 gallons.

<sup>2</sup> The fractional estimated mean spill number and volume are rounded to the nearest whole number.

### **K.1.3 Probability of a Very Large Oil Spill - Greater Than or Equal to 120,000 Barrels**

Size assumptions for very large spills for planning area facilities and pipelines are based on response planning standards and discharge estimates for the Alpine oil field (ARCO Alaska 1999, Phillips 2001). Blowouts are unlikely events. While blowouts are often equated with catastrophic spills, very few blowout events have resulted in spilled oil, and the volumes that are spilled are often small.

## **K.2 Oil Weathering and Spreading**

Information about oil weathering and the aerial extent of an oil spill were estimated from oil weathering models and historical information.

### **K.2.1 Modeling Simulations of Oil Weathering**

To judge the effect of an oil spill, the following volumes must be estimated:

- the amount of oil that evaporates;
- the amount of oil that disperses; and
- the amount of oil that remains after a certain time period.

Alpine field crude oil was used as the analog of oil types in the planning area. Weathering estimates of Alpine field crude oil and Arctic diesel (over a 30-day period) were derived by the SINTEF Oil Weathering Model (OWM), Version 2.0 (Reed et al. 2000).

Individual weathering results for Alpine field crude oil spills from the SINTEF OWM model are shown in Table K-5 and Table K-6. The SINTEF OWM changes both oil properties (density, viscosity, pour point, flash point, and water content) and physical properties (spreading,



evaporation, oil-in-water dispersion, and water uptake) of the oil. The OWM performs a 30-day time horizon on the model weathering calculations, but with a warning that the model is not verified against experimental field data for more than 4 to 5 days. The SINTEF OWM has been tested extensively with results from three full-scale field trials of experimental oil spills (Daling and Strom 1999).

The SINTEF OWM does not incorporate the effects of:

- currents
- beaching
- containment
- photo-oxidation
- microbiological degradation
- adsorption to particles
- encapsulation by ice

The spill sizes chosen for oil weathering were 500 and 900 bbl for the Alpine field-type crude oil spill, and 900 bbl for a diesel spill. Two general scenarios were simulated—one in which oil spills into open water, and another in which oil freezes into the ice and melts into 50% ice cover. It was assumed that open water occurs July through September, and that a winter spill melts out in July. For open water, the weathering of the 500- and 900-bbl spills was modeled as instantaneous spills. For the meltout spill scenario, the entire spill volume was modeled as an instantaneous spill. Although different amounts of oil could melt out at different times, the MMS assumed a conservative approach—all oil was released at the same time. Results are reported for the end of 1, 3, 10, and 30 days. The assumed fate and behavior of Alpine field crude oil and diesel oil, information that was used in the analysis of the effects of oil on environmental and social resources, are summarized in Table K-5 and Table K-6.

**Table K-5. Fate and Behavior of a Hypothetical 500 bbl Oil Spill from Lagoon Pipelines.<sup>1</sup>**

Features	Summer Spill <sup>2</sup>				Meltout Spill <sup>3</sup>			
Time after spill in days	1.0	3.0	10.0	30.0	1.0	3.0	10.0	30.0
Oil remaining (percent)	75.4	68.0	44.0	38.0	77.0	71.9	64.3	57.6
Oil dispersed (percent)	0.6	2.0	8.0	22.0	0.0	0.1	0.7	2.4
Oil evaporated (percent)	24.0	30.0	36.0	40.0	23.0	28.0	35.0	40.0
Thickness (mm)	3.1	1.9	1.1	1.0	4.6	2.7	1.5	1.0
Discontinuous area (mi <sup>2</sup> ) <sup>4</sup>	0.6	3.1	15.5	63.9	0.6	4.3	10.5	83.0
Estimated coastline oiled (mi) <sup>5</sup>	10.5				9.9			

<sup>1</sup> Calculated with the SINTEF Oil Weathering Model Version 2.0 (Reed et al. 2000), assuming an Alpine field crude type.

<sup>2</sup> Summer (July through September) and assumes: 12-knot wind speed, 33 degrees Fahrenheit, and 1.3-feet (0.4-meter) wave height.

<sup>3</sup> Spill is assumed to occur in May into first-year ice, pools 0.8 inches (2 cm) thick on ice surface for 2 days at 32 degrees Fahrenheit before meltout into 50% ice cover, 11-knot wind speed, and 0.3 feet (0.1 meter) wave heights.

<sup>4</sup> Calculated from Equation 6 of Table 2 in Ford (1985), and is the discontinuous area of a continuing spill or the area swept by an instantaneous spill of a given volume. Ice dispersion occurs for about 30 days before meltout.

<sup>5</sup> Calculated from Equation 17 of Table 4 in Ford (1985), and is the result of stepwise multiple regression for length of historical coastline affected.

The structure of the ADEC Alaska North Slope spill database does not facilitate a quantitative analysis of pipeline spill rates for small spills. The ADEC database specifically identifies five pipeline leaks among 975 spill records. The volumes of these pipeline leaks are 0.7, 5, 18, 125,



and 510 bbl. Additionally, any spills occurring or moving off pads would have some potential to enter a river or water body. For the purposes of this oil spill analysis, the percent of crude oil spills occurring on a pad versus off the pad and onto the surrounding environment was estimated. Approximately 65 to 80% of all crude oil spills would occur on a pad and have little or no effect on the environment. Approximately 20 to 35% could occur in or reach the surrounding environment.

**Table K-6. Fate and Behavior of a Hypothetical 900 bbl Oil Spill From a Lagoon Facility.<sup>1</sup>**

Features	Summer Spill <sup>2</sup>				Meltout Spill <sup>3</sup>			
Time after spill in days	1	3	10	30	1	3	10	30
Oil remaining (percent)	75.5	68.4	57.9	40	76.9	71.8	64	56.5
Oil dispersed (percent)	0.5	1.6	6.1	20	0.1	0.2	1	3.5
Oil evaporated (percent)	24	30	36	40	23	28	35	40
Thickness (millimeters)	4.1	2.5	1.5	1	6.1	3.9	1.9	1.2
Discontinuous area (square miles) <sup>4</sup>	0.6	4.3	21.1	86.8	1.2	5.6	26.7	112.2
Estimated coastline oiled (miles) <sup>5</sup>	13.6				13.0			

<sup>1</sup> Calculated with the SINTEF Oil Weathering Model Version 2.0 (Reed et al. 2000), assuming an Alpine field crude type.  
<sup>2</sup> Summer (July through September) assumes: 12-knot wind speed, 33 degrees Fahrenheit, and 1.3-foot (0.4-meter) wave height.  
<sup>3</sup> Spill is assumed to occur in May into first-year ice, pools 0.8 inches (2 cm) thick on ice surface for 2 days at 32 degrees Fahrenheit before meltout into 50% ice cover, 11-knot wind speed, and 0.3 feet (0.1 meter) wave heights.  
<sup>4</sup> Calculated from Equation 6 of Table 2 in Ford (1985), and is the discontinuous area of a continuing spill or the area swept by an instantaneous spill of a given volume. Ice dispersion occurs for about 30 days before meltout.  
<sup>5</sup> Calculated from Equation 17 of Table 4 in Ford (1985), and is the result of stepwise multiple regression for length of historical coastline affected.

## K.2.2 Observations of Historic North Slope Spill Patterns

The development scenarios for alternatives A, B, C, and D include an onshore pipeline. Of greatest concern would be the possible contamination of the Colville River, because a pipeline could cross or underlie the Colville River and some of its tributaries, and Teshekpuk Lake.

Those spills reaching the surrounding environment generally remain restricted to a limited area of the tundra unless they reach a river, stream, or other water body. The ADEC records are not accurate enough to provide statistical spill size areas. The following are comments based on information from the ADEC database and Behr-Andres et al. (2001). Off-pad spills that occur in or reach the environment generally cover a small area (less than or equal to 500 ft<sup>2</sup>). Larger areas of contamination occur when wind blows a fine oil mist over a large area. The largest area ever covered was the result of a pipeline spill on December 30, 1993, at drill site 5, well 23, which misted a fine oil spray of 4 bbl over a tundra area of 100 to 145 acres (Mueller 1997). Crude oil from a failed flowline spilled onto a gravel pad, reserve pit, and impoundment. High winds resulted in the crude oil being misted over the snow-covered tundra in an area approximately 330 feet wide and 1,300 feet long (Behr-Andres et al. 2001). Of the off-pad spills that occur, many contact snow or ice, which is cleaned up before the oil reaches the tundra. Smaller spills are likely to be contained within the snow layer, depending on snow depth and density. Larger spills are more likely to reach the ground surface. The ADEC database documents that a spill at Point McIntyre covered approximately 23 acres of snow-covered tundra with 142 bbl of crude oil. Because this area was snow covered, there was little impact to



the surrounding environment. If this spill had occurred during the summer, the impacts would have been very different.

### K.3 Cumulative Analysis of Oil Spills

This section discusses how the oil spills for Effects of the Cumulative Case (section 4.7) were estimated.

#### K.3.1 Preparing the Cumulative Analysis

The TAPS pipeline, onshore Alaska North Slope, TAPS tankers, and the Alaska Outer Continental Shelf have varying spill rates and spill-size categories. For a summary of the spill rates and spill size categories that were assumed for analysis of oil spills in the cumulative case, see Table K-7. One noteworthy fact is that most oil originating from either onshore or offshore on the North Slope of Alaska flows through the TAPS pipeline and into TAPS tankers.

**Table K-7. Oil Spill Rates and Spill-size Categories Used to Estimate Large Crude Oil Spills for the Cumulative Analysis**

Location	Beaufort OCS		Alaska North Slope 1985-2001		TAPS Pipeline 1985-2001		TAPS Tanker 1977-1999	
	Spill Rate (Spills/Bbbl)	Size Category (bbl)	Spill Rate (Spills/Bbbl)	Size Category (bbl)	Spill Rate (Spills/Bbbl)	Size Category (bbl)	Spill Rate (Spills/Bbbl)	Size Category (bbl)
Offshore	0.23	≥1,000	-	-	0.21	≥500	0.88	≥1,000
Onshore	-	-	0.64	≥500	0.21	≥500	0.88	≥1,000

Sources: Anderson and LaBelle (2000), Bercha Group, Inc. (2002), and USDOJ MMS (2002).

Estimates of past, present, and reasonably foreseeable production are used for the quantitative analysis of oil spills. Past, present, and reasonably foreseeable production contributes 14.4 Bbbl in reserves and resources, with the planning area contributing an additional 1.5 Bbbl (the mean resource value for the planning area), for a total of 15.9 Bbbl.

#### K.3.2 Estimating Possible Future Spills from All Sources

The estimated mean number and volume of spills for the cumulative case are shown in Table K-8. The likely number of additional oil spills in the Beaufort Sea, onshore, along the TAPS pipeline, or tanker route due to projects in the planning area is two. Thus, for purposes of analysis of the cumulative case, it is assumed that the planning area would contribute a total of two additional oil spills offshore in the Beaufort Sea, onshore, or along the TAPS pipeline or tanker route.

The Beaufort Sea pipeline and platform spill size range used in the analysis is 1,500 to 4,600 bbl. The onshore spill size range used is 500 to 900 bbl. For the cumulative case, a TAPS pipeline spill of 4,400 bbl is estimated. The average spill sizes from TAPS tankers and the distribution of the number of spills used for this analysis is as described in the Northwest National Petroleum Reserve – Alaska IAP/EIS (USDOJ BLM and MMS 2003).

It is estimated that one spill greater than or equal to 1,000 bbl would occur as a result of activities in the Beaufort Sea over the lifetime of planning area projects. This estimate is based on production from past, present, and reasonably foreseeable development. Possible offshore



sources in these categories (past, present, and reasonably foreseeable development) include Endicott, Northstar, Kalubik, Gwydyr Bay, Flaxman Island, Liberty, Kuvlum, and Hammerhead. This estimate also includes potential production from undiscovered resources on Federal leased tracts in the Beaufort Sea.

It is estimated that eight spills greater than or equal to 500 bbl would occur onshore before entering the TAPS pipeline. One of these spills is likely to be related to planning area projects.

It is estimated that three spills greater than or equal to 500 bbl would occur along the TAPS pipeline, although it is unlikely that the additional throughput given planning area projects would increase the number of spills.

Fourteen spills greater than or equal to 1,000 bbl are expected to occur as a result of projects along the TAPS tanker route, one would be expected to be due to the additional volume from planning area projects. Of these:

- nine spills with a mean size of 4,000 bbl—four in port and two at sea—would be expected to occur;
- four spills with a mean size of 13,000 bbl would be expected to occur at sea; and
- one spill with a size ranging from 200,000 to 260,000 bbl (for purposes of analysis 250,000 bbl) would be expected to occur at sea.

Previous studies show that the chance of one or more spills both occurring and contacting land along the U.S. coast adjacent to the TAPS tanker route is less than or equal to 3% (LaBelle et al. 1996).



**Table K-8. Cumulative Oil-Spill-Occurrence Estimates  $\geq 500$  bbl and  $\geq 1,000$  bbl over Assumed 15-20 Year Production Life of the Northeast National Petroleum Reserve – Alaska**

Spill Location and Timeframe	Crude-Oil Spills					
	Reserves and Resources (Bbbl)	Spill Rate (Spills/ Bbbl)	Size Category	Assumed Size (bbl)	Most Likely Number	Estimated Mean Number of Spills
<b>Offshore</b>						
Past, present, and reasonably foreseeable	2.80	0.23	$\geq 1,000$ bbl	NA	1	0.64
Planning Area	NA	0.23	$\geq 1,000$ bbl	NA	NA	NA
<b>Total</b>	<b>2.80</b>	<b>0.23</b>	<b><math>\geq 1,000</math> bbl</b>	<b>NA</b>	<b>1</b>	<b>0.64</b>
<b>Onshore</b>						
Past, present, and reasonably foreseeable	11.6	0.64	$\geq 500$ bbl	500–900	7	7.42
Planning Area	1.5	0.64	$\geq 500$ bbl	500–900	1	0.96
<b>Total</b>	<b>13.1</b>	<b>0.64</b>	<b><math>\geq 500</math> bbl</b>	<b>500–900</b>	<b>8</b>	<b>8.38</b>
<b>TAPS (Pipeline)</b>						
Past, present, and reasonably foreseeable	14.4	0.21	$\geq 500$ bbl	4,400	3	3.02
Planning Area	1.5	0.21	$\geq 500$ bbl	4,400	0	0.32
<b>Total</b>	<b>15.9</b>	<b>0.21</b>	<b><math>\geq 500</math> bbl</b>	<b>4,400</b>	<b>3</b>	<b>3.34</b>
<b>TAPS (Tanker )</b>						
Past, present, and reasonably foreseeable	14.4	0.88	$\geq 1,000$ bbl	varies	13	12.67
Planning Area	1.5	0.88	$\geq 1,000$ bbl	varies	1	1.32
<b>Total</b>	<b>15.9</b>	<b>0.88</b>	<b><math>\geq 1,000</math> bbl</b>	<b>varies</b>	<b>14</b>	<b>13.99</b>
Note: The ADEC database has no significant crude oil spills on the North Slope resulting from well blowouts and no facility or onshore pipeline spills greater than 1,000 barrels for the years 1985-2000. NA = Data not available or not applicable. Source: USDO I MMS (2002).						



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## **Appendix L: 1998 ROD**









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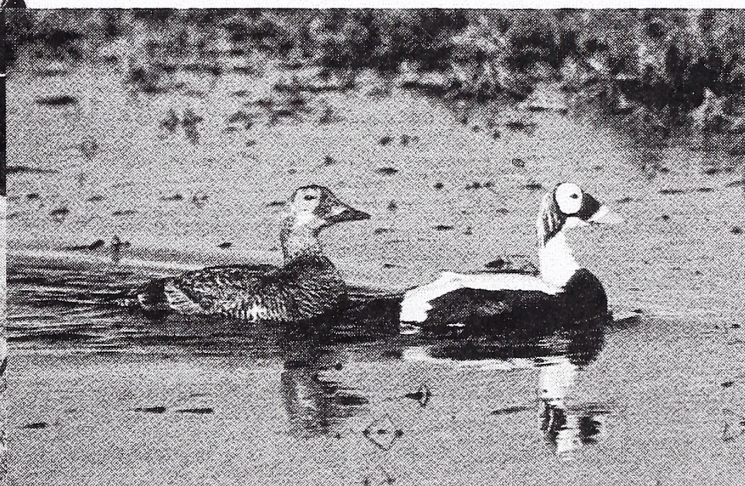
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U.S. Department of the Interior  
Minerals Management Service

October 1998

# Northeast National Petroleum Reserve-Alaska

## Integrated Activity Plan/ Environmental Impact Statement

### Record of Decision










**Northeast  
National Petroleum Reserve-Alaska**

**Integrated Activity Plan/  
Environmental Impact Statement**

**Record of Decision**

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 10/7/98

Bruce Babbitt  
Secretary of the Interior

Date

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**October 1998**

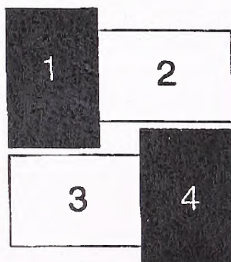
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# Contents

Summary	v
Decision	1
Alternatives Considered	9
Management Considerations	13
ANILCA Section 810 Summary	17
Mitigation and Monitoring	21
Public Involvement	23
Appendices	
A--Modifications and Clarifications	25
B--Stipulations	29







# Summary

The Bureau of Land Management's (BLM) Northeast National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) describes the future multiple-use management of 4.6 million acres of the NPR-A, consistent with existing statutory direction for its management. The plan emphasizes restrictions on surface activities, consultation with local residents, and coordinated scientific studies to protect wildlife habitat, subsistence use areas, and other resources. At the same time it makes approximately 87 percent of the planning area available for oil and gas leasing. In reaching the decisions embodied in this Record of Decision (ROD), BLM has received extensive assistance from other Federal agencies, the State of Alaska, the North Slope Borough, and thousands of individuals and institutions who have shared their knowledge and insights about the resources and values associated with the planning area.

This plan fulfills Congress's mandate in the Naval Petroleum Reserves Production Act (NPRPA) to conduct "an expeditious program of competitive leasing of oil and gas" and at the same time to protect the significant subsistence, environmental, fish and wildlife, and historic or scenic values "consistent with the requirements of this Act for the exploration of the reserve." Under the plan, important oil and gas resources, including those which may lie near the Alpine field now under construction just east of the Reserve, will be made available for leasing. Stipulations protect surface resources and subsistence activities throughout the planning area. The plan also protects key surface resource and use areas identified through the planning process by strict restrictions on surface activities and, in 13 percent of the area, through a decision not to offer lands for oil and gas leasing. Included among the areas receiving special protections are important habitat for waterfowl and caribou in the vicinity of Teshekpuk Lake, wildlife habitat and recreation and scenic areas along the Colville River and some of its tributaries, and subsistence use lands critical to local residents near Teshekpuk Lake and several rivers and creeks.

The IAP/EIS analyzed six alternative future management plans for public comment, including the Preferred Alternative. Alternative A was the environmentally preferred alternative. But because it offered no lands for oil and gas leasing, the BLM determined that it would not be appropriate for adoption because it fails to fulfill legislative mandates to provide opportunities for oil and gas development of the Reserve.

The IAP/EIS also determined that while the Preferred Alternative independent of associated cumulative effects did not reach the "may significantly restrict" threshold for impacts on subsistence applicable to section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), assessed with past, present, and anticipated cumulative effects, the Preferred



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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Alternative did cross that threshold. The plan, however, meets the legal requirements for Federal actions which may result in a significant restriction on subsistence uses; i.e. the restriction is necessary, consistent with sound management principles for utilization of the public lands; the plan involves the minimal amount of public lands necessary to accomplish the purposes of such utilization; and reasonable steps will be taken to minimize adverse impacts on subsistence uses and resources resulting from the plan.



# Decision

The plan described below is hereby adopted for future management in the northeast planning area of National Petroleum Reserve-Alaska. The plan adopted here is the Preferred Alternative presented in the *Northeast National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement* with minor clarifications and changes noted, explained, and evaluated in Appendix A. Comments offered by the public and other government agencies have resulted in these clarifications and minor modifications of the Preferred Alternative. We thank those who have helped us in this planning process through their comments.

The plan emphasizes restrictions on surface activities, consultation with local residents, and coordinated scientific studies to protect wildlife habitat, subsistence use areas, and other resources. At the same time it makes approximately 87 percent of the planning area's 4.6 million acres available for oil and gas leasing.

This decision culminates the Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) process. It fulfills the National Environmental Policy Act (NEPA) requirements associated with management planning on these public lands, including making decisions on what lands to make available for oil and gas leasing. It serves as the NEPA documentation for the first oil and gas lease sale. Subsequent lease sales are contemplated within the portion of the planning area made available for leasing. Prior to authorizing future site-specific activity on these lands or conducting any additional lease sales, the Bureau of Land Management (BLM) will conduct the appropriate additional NEPA analysis, tiering from the IAP/EIS, if appropriate.

The decision is described below and includes the stipulations in Appendix B

## Teshkepuk Lake Special Area

***Teshkepuk Lake Surface Protection Area:*** This area is depicted in green (including the green hatched area) on Figure II.C 1 of the Final IAP/EIS reproduced here on page 3. It encompasses important goose molting areas, caribou calving and insect-relief habitat, and all of Teshkepuk Lake. It is of special importance to subsistence users because of the caribou and fish resources in the area and long-standing subsistence use of the area. Within this area

- No permanent oil and gas surface occupancy will be allowed. (Note: Unless otherwise noted, reference to no permanent oil and gas occupancy would prohibit



- pads, rigs, platforms, gravel roads, airstrips, gravel or other material extraction pits, and pipelines )
- No seasonal exploratory or delineation wells will be allowed.
- Ice roads, seismic activities, winter overland moves, and other nonpermanent activities other than exploratory or delineation well drilling may be authorized
- Oil and gas leasing will be allowed in the 5- to 6-mile band (hatched area on Fig II C 1) at the southern and western edge of this area. Rights to the subsurface resources under leases in this area will not include the uppermost 500 feet.
- Restrictions will be imposed on aircraft activity associated with permitted activities (See stipulations 52-55 )

***Miguakiak River:***

- No permanent oil and gas surface facilities, except essential transportation crossings (roads and pipelines), will be allowed within ½ mile of the river
- An area within 3 miles of the river is of particular sensitivity for subsistence activities and will receive special consideration within the consultation framework described in stipulation 61.

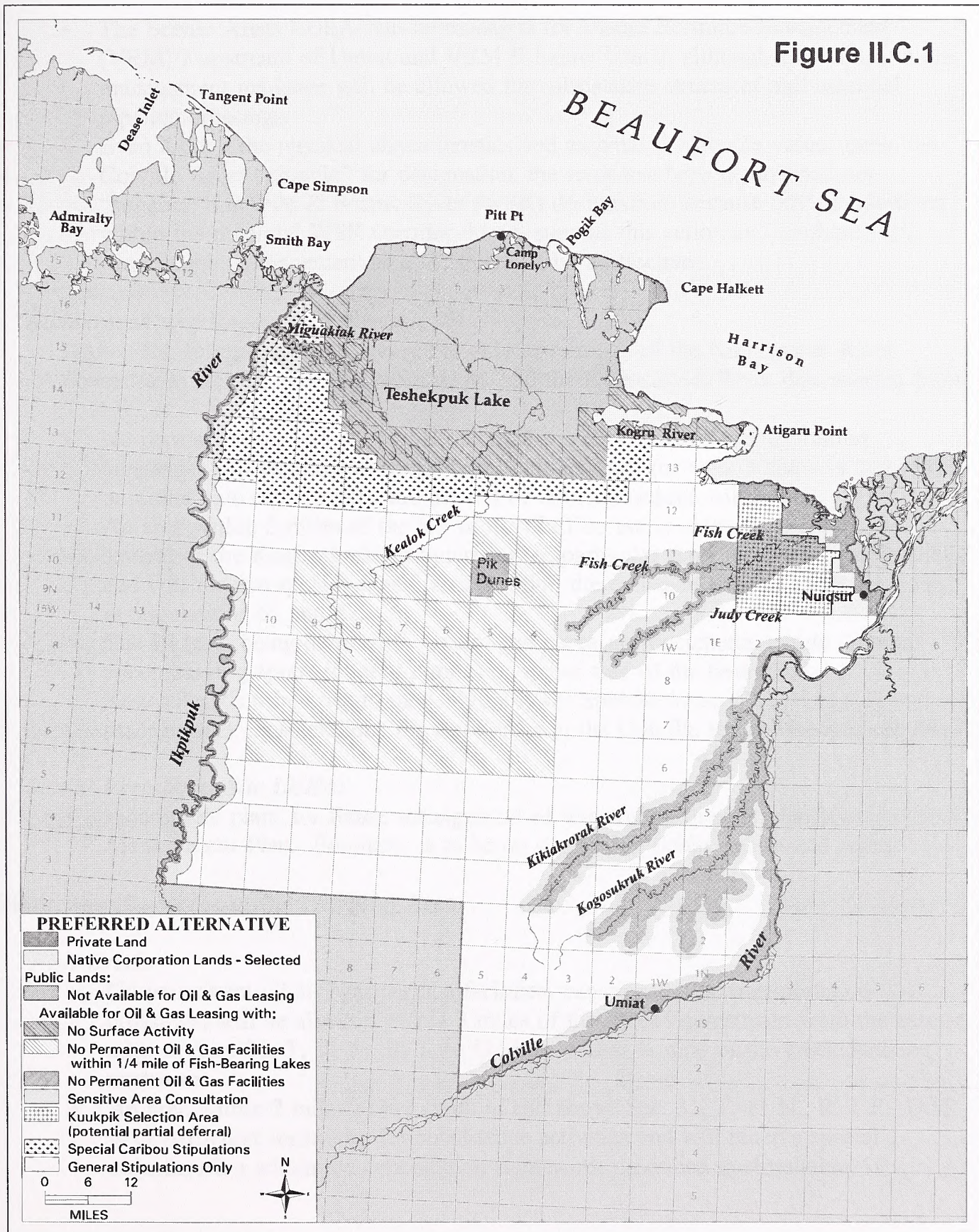
**Colville River Special Area**

***Colville River:***

- The BLM will develop a Colville River Management Plan for the Special Area in cooperation with adjacent landowners and other affected parties to address subsistence, wildlife, recreation, paleontological, and other issues. Prior to launching such a plan, the agency will conduct a raptor workshop to review scientific literature on disturbance to raptors and identify potential additional mitigation measures. Creation of a Bird Conservation Area as described in Section II B.6 of the Final IAP/EIS will be explored with other landowners as part of the Colville River Management Plan.
- No permanent oil and gas surface facilities, except essential pipeline crossings, will generally be allowed within 1 mile of the west bluffs (or bank if there is no bluff) extending the length of the river in the Colville River Raptor, Passerine and Moose Land Use Emphasis Area (LUEA) (Maps depicting this and other LUEAs mentioned in this document can be found in the Final IAP/EIS, pp II-4 to II-17 )
- An area within 2 miles of the west bluff (or bank if there is no bluff) extending the length of the river in the Colville River Raptor, Passerine and Moose LUEA is of particular sensitivity for subsistence activities and wildlife and will receive special consideration within the consultation frameworks described respectively in stipulations 61 and 62.



Figure II.C.1









- The Scenic Areas LUEA will be managed for Visual Resource Management (VRM) I upstream of Umiat and VRM II below Umiat, although exceptions to this management guidance will be allowed for subsistence structures and essential pipeline crossings.
- Even though the physical characteristics and associated resource values make the Colville River “eligible” for designation, the river has been determined not “suitable” for Wild & Scenic River (WSR) designation, because other landowners within the potential WSR corridor do not support this action and, without their cooperation, management as a WSR would be ineffective.

***Kikiakrorak and Kogosukruk Rivers:***

(Note: The following discussion refers only to portions of the Kikiakrorak River downstream from T. 2 N., R. 4 W., U.M. and the Kogosukruk River downstream from T. 2 N., R. 3 W., U.M.)

- No permanent oil and gas surface facilities, except essential transportation crossings, will be allowed within 1 mile of the bluff (or bank if there is no bluff) on either side of the rivers and several of the Kogosukruk tributaries.
- An area within 2 miles of the top of the bluff on either side of the rivers and several of the Kogosukruk's tributaries is of particular sensitivity for raptor nesting and will receive special consideration within the consultation framework described in stipulations 61 and 62.
- The BLM is being directed to prepare the necessary documents to add an area encompassing approximately 2 miles on either side of the rivers and the Kogosukruk's tributaries to the Colville River Special Area. The BLM will include management considerations for these areas in the Colville River Management Plan.

***Umiat Recreation Site LUEA:***

- Incorporate plans for future management of this area in the Colville River Management Plan. Emphasis is to be on supporting public health and safety.

**Other Specific Areas in the Planning Area**

***Fish Creek:***

- No permanent oil and gas surface facilities, except essential transportation crossings, will be allowed within 3 miles of the creek downstream from the eastern edge of Sec. 31, T. 11 N., R. 1 E., U.M. or within ½ mile of the creek farther upstream.
- An area within 2 miles of the creek in and above Sec. 31, T. 11 N., R. 1 E., U.M. is of particular sensitivity for subsistence activities and will receive special consideration within the consultation framework described in stipulation 61.



***Judy Creek and Ikpikpuk River (in the planning area):***

- No permanent oil and gas surface facilities, except essential transportation crossings, will be allowed within ½ mile of these waterbodies.
- An area within 2 miles of these waterbodies is of particular sensitivity for subsistence activities and will receive special consideration within the consultation framework described in stipulation 61.

***Pik Dunes LUEA:***

- No surface structures, except essential transportation crossings, will be allowed.
- The BLM is being directed to prepare the necessary documents to add the LUEA to the Teshekpuk Lake Special Area.

***Deep-Water Lakes:***

- No permanent oil and gas surface facilities will be allowed in the lake bed of fish-bearing lakes in this portion of the Fish Habitat LUEA. Nor will such occupancy be allowed within ¼ mile of these fish-bearing lakes.

***Kuukpik Corporation Entitlement:***

- The BLM has asked Kuukpik to identify twice its underselection acreage. In its first oil and gas lease sale, BLM will defer from leasing those lands Kuukpik identifies.

The plan also includes decisions which apply to the entire planning area. These are incorporated in the stipulations for the plan which are listed in Appendix B. They address such topics as waste prevention, handling, and disposal; preventive measures and preparation and response to spills; ice roads and water use; overland moves and seismic work (which are allowed throughout the planning area subject to stipulations); oil and gas exploratory drilling; facility design and construction; ground transportation; air traffic; oil field abandonment; and subsistence.

The plan establishes procedures and advisory bodies to address subsistence and research (inventory and monitoring) concerns. Stipulation 61 describes a conflict avoidance procedure to address subsistence concerns with oil and gas exploration and development activities. Through it, lessees will consult with the North Slope Borough (NSB), affected communities, and the Subsistence Advisory Panel, a special body created to represent subsistence issues (See Sec. II.F.6 of the Final IAP/EIS). Under the plan, representatives from Federal, State, and NSB agencies, the oil industry, environmental groups, academia, and other interested parties will be invited to participate on a Research and Monitoring Team. This team will coordinate research and monitoring projects related to the effectiveness of stipulations and surface resource impacts. It also will seek advice from the Subsistence Advisory Panel (See



Sec. II.F.7 of the Final IAP/EIS). The team will be chartered in accordance with the Federal Advisory Committee Act.

Many of the geographically-specific restrictions listed above are also included in the stipulations. Nearly all stipulations are subject to an exception clause. Exceptions to a stipulation may be granted under strict conditions. In the event that an exception to a lease or permit stipulation is requested and before an exception may be granted, the AO shall find that implementation of the stipulation is:

1. a) technically not feasible or  
b) economically prohibitive or  
c) an environmentally preferable alternative is available, and
2. the alternative means proposed by the lessee fully satisfies the objective(s) of the stipulation.

In addition, prior to the consideration or granting of an exception to a lease or permit, all conditions and/or consultation requirements specific to a stipulation must be met. The Authorized Officer (AO) shall consult with appropriate Federal, State, and NSB regulatory and resource agencies before an exception may be granted, except in the case of an emergency. The AO's power to grant stipulation exceptions is limited to those subjects, uses, and permits over which the BLM has authority. Exceptions also may be granted in emergencies involving human health and safety.

Some decisions listed above and in the stipulations are not subject to the exception clause. These include:

1. decisions on the areas to be available or unavailable for oil and gas leasing,
2. prohibition of permanent roads connecting to a road system outside the planning area,
3. prohibitions on pipeline and road crossings in the setback area around Teshekpuk Lake and road crossings in the setback area adjacent to the Colville River, and
4. prohibitions on permanent oil and gas surface occupancy in the Teshekpuk Lake Surface Protection Area

The plan will not affect other non-discretionary BLM responsibilities mandated by Congress. Chief among these is conveyance of land to individual Alaskan Natives and to Native corporations under the Native Allotment Act and the Alaska Native Claims Settlement Act (ANCSA), respectively.







## Alternatives Considered

*The Northeast National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement* presented the Preferred Alternative and 5 other alternatives.

**Preferred Alternative:** The Preferred Alternative is nearly identical to the plan described in this Record of Decision. (See Appendix A for explanations of minor clarifications and changes.) It would maximize protection for molting geese by making virtually all of the Goose Molting Habitat LUEA unavailable for leasing. The Preferred Alternative would protect caribou calving areas in the Teshekpuk Lake Caribou LUEA by not making 48 percent of the LUEA available for oil and gas leasing (including the key caribou movement corridors), buffered by an area (30% of the LUEA) available for leasing but with no surface oil and gas activities allowed (including no exploratory drilling), and a small portion (22%) available, subject to stipulations specifically designed to limit impacts. The Preferred Alternative would make 87 percent of the planning area (4,007,000 acres and 67% of the area of high oil and gas potential) available for oil and gas leasing and allows seismic operations throughout the area subject to stipulations. The Preferred Alternative also establishes procedures and advisory bodies to address subsistence and research (inventory and monitoring) concerns.

**Alternative A:** This alternative is the No Action alternative. It reflects current BLM management of the planning area and a decision BLM has made that the 1983 EIS for leasing in the 1980s is inadequate for renewed leasing. No new oil and gas leasing would occur, no new designations such as Special Areas or Wild and Scenic Rivers would be proposed, and protection of surface resources from other activities would be provided by existing Special Area designations, Special Management Zones, and existing stipulations. Under this alternative two options exist with regard to seismic activity. Winter seismic activity could occur throughout the planning area (the existing management situation), or seismic activity could be prohibited. Alternative A is the **environmentally preferable alternative**, because it would forbid oil and gas leasing, the most likely activity to create environmental impacts. This alternative, however, was not chosen because it would not fulfill the legislative direction to make lands in the Reserve available for oil and gas development.

**Alternative B:** Alternative B would make 53 percent of the planning area available for oil and gas leasing while emphasizing protection of specific surface resources. With the exception of the Kuukpik Corporation Entitlement LUEA, none of the LUEAs would be made available for oil and gas leasing. Leasing in the Kuukpik Corporation Entitlement LUEA would be postponed until the corporation's entitlement has been satisfied. Aboveground



pipelines could cross all lands except the Potential Colville Wild and Scenic River LUEA, and all lands would be available for seismic studies. Protective measures include applying the stipulations described in the Draft and Final IAP/EISs, recommending a portion of the Colville be included as a wild river in the WSR System, proposing a Bird Conservation Area along the Colville River, designating the Ikpihpuk Paleontological Sites LUEA as a new Special Area to protect paleontological resources, and adding the Pik Dunes LUEA to the Teshekpuk Lake Special Area. BLM would undertake plans for areas receiving new designations.

**Alternative C:** Alternative C would make 72 percent of the planning area available for oil and gas leasing. The Teshekpuk Lake Caribou Habitat LUEA and the Goose Molting Habitat LUEA, which contain important caribou and waterfowl habitat, would not be made available. The Kuukpik Corporation Entitlement LUEA would be available for oil and gas leasing, and all appropriate sale and leasing revenues due Arctic Slope Regional Corporation (ASRC) would be put in escrow. Aboveground pipelines could cross all lands, and all lands would be available for seismic studies. Protective measures would include applying stipulations described in the Draft and Final IAP/EISs, recommending a portion of the Colville be included as a scenic river in the WSR System, and proposing the same management designations for a Bird Conservation Area (BCA) and the Ikpihpuk Paleontological Sites and Pik Dunes LUEAs as noted for Alternative B. BLM would undertake plans for areas receiving new designations.

**Alternative D:** Alternative D would make 90 percent of the planning area available for oil and gas leasing. The Goose Molting Habitat LUEA would not be made available. The Kuukpik Corporation Entitlement LUEA would be available for oil and gas leasing, and all appropriate sale and leasing revenues due ASRC would be put in escrow. Aboveground pipelines could cross all lands within the planning area, and all lands would be available for seismic studies. Stipulations would protect caribou in the part of the Teshekpuk Lake Caribou Habitat LUEA available for oil and gas leasing. Other protective measures include applying other relevant stipulations described in the Draft and Final IAP/EISs, recommending a portion of the Colville be included as a recreational river in the WSR System, and proposing the same management designations for a BCA and the Ikpihpuk Paleontological Sites and Pik Dunes LUEAs as noted for Alternative B. BLM would undertake plans for areas receiving new designations. In addition, the agency would conduct an interagency wildlife management plan focusing on caribou and waterbird populations within the Teshekpuk Lake Caribou Habitat and the Goose Molting LUEAs.

**Alternative E:** Alternative E makes all BLM-administered lands in the planning area available to oil and gas leasing. The Kuukpik Corporation Entitlement LUEA would be available for oil and gas leasing, and all appropriate sale and leasing revenues due ASRC



would be put in escrow. Aboveground pipelines could cross all lands within the planning area, and all lands would be available for seismic studies. Stipulations would protect caribou in the Teshekpuk Lake Caribou Habitat LUEA and others would protect waterfowl in the Goose Molting Habitat LUEA. Other protective measures would include applying other relevant stipulations described in the Draft and Final IAP/EISs and proposing the same management designations for a BCA and the Ikpikpuk Paleontological Sites and Pik Dunes LUEAs as noted for Alternative B. BLM would undertake plans and studies similar to those anticipated for Alternative D.







## Management Considerations

This plan fulfills Congress's mandate in the Naval Petroleum Reserves Production Act (NPRPA) to conduct "an expeditious program of competitive leasing of oil and gas" and at the same time to protect the significant subsistence, environmental, fish and wildlife, and historic or scenic values "consistent with the requirements of this Act for the exploration of the reserve." This plan meets the total energy needs of the nation by making 87 percent of the planning area available for leasing, including lands nearest current oil development immediately to the east of the Reserve. Maximum protection of important surface resources is provided in Special Areas designated by the Secretary through a combination of prohibitions, restrictions, and stipulations restricting oil and gas facilities and other activities which might adversely impact wildlife habitat and subsistence use areas, as well as by positive management approaches.

Because of the years required to find, delineate, and develop a producing oil field in the remote arctic environment, oil leasing is not conducted to meet today's need but future projected needs. The U.S. currently imports about half its oil supply, and the Federal government projects that the proportion of the Nation's oil coming from overseas will continue to climb, approaching two-thirds by 2020. The Department of Energy also reports that domestic oil and gas production in the U.S. overall is declining, as it is on the North Slope of Alaska. Oil produced from the NPR-A would be transported using excess capacity of the existing Trans-Alaska Pipeline System, which would be available in the timeframe projected for development of new NPR-A fields. The Department of Energy also reports that importation of foreign oil significantly exacerbates this country's trade deficit. Domestic oil production, especially on Federal lands, contributes directly to the health of the Nation's economy and to Federal revenues. Most NPR-A oil is expected to be processed and consumed domestically. Even if a small portion of NPR-A oil may be exported, it can still help in the nation's trade imbalance and thereby indirectly help meet the nation's energy needs. Demand for petroleum is typically proportionately greater in relation to supply on the East Coast than on the West Coast. Because of transportation costs, the nation can obtain more oil with a given amount of money by purchasing foreign oil for the East Coast than shipping Alaskan oil there. Viewed in terms of a balance of trade, exporting an amount of Alaskan oil can produce export revenues which can be applied to purchase a greater amount of imported oil. In addition, the oil industry provides jobs, many of them high-skill and high-paying. Finally, lease sales, rentals, bonuses, and royalties from Federal oil and gas leases contribute to the Federal treasury, as do taxes paid by oil companies and their workers.

Federal law, including the NPRPA, the Federal Land Policy and Management Act (FLPMA), ANILCA, NEPA, and the Wild and Scenic Rivers Act, requires BLM to protect soil, water,



air, vegetation, wildlife, archaeological and paleontological resources, and subsistence uses. These resources are protected through prohibitions, restrictions, and stipulations on oil and gas and other activities which will effectively minimize environmental impacts, as well as through positive management approaches, such as Special Area designations, the development of the Colville River Management Plan, and other protective management measures.

The Alaska National Interest Lands Conservation Act (ANILCA) § 810 mandates special consideration for subsistence resources and uses. Subsistence concerns were also identified early in the planning process as a major management consideration. The plan includes special measures to protect subsistence use areas (e.g. Teshekpuk Lake, Fish and Judy Creeks and Miguakiak River and cabins and campsites) and wildlife habitats for waterfowl, caribou, and fish. In addition, to assure that subsistence resources and access to those resources are protected, the plan requires the integration of a consultation process into future oil and gas exploration and development. As part of this consultation process, BLM will institute a Subsistence Advisory Panel which will advise both industry and the agency on potential conflicts between proposed development actions and subsistence activities. Stipulations in the plan also provide for continued reasonable access by subsistence users through developed areas, avoiding as much as possible any restrictions on access to subsistence resources. The plan specifically prohibits an interconnecting road network linking the planning area to existing oil fields and roads to the east, thus alleviating concerns about possible increased competition for subsistence resources from persons residing outside the region.

Through the planning process, BLM has also identified significant wildlife concerns and has provided special protection for important habitats for waterfowl, caribou, raptors, and fish. Most of these specially protected areas fall within the existing secretarially-designated Special Areas. The decisions in this ROD provide maximum protection for the significant subsistence, recreational, fish and wildlife, historical, and scenic values of these Special Areas, consistent with the requirements of the NPRPA for exploration of the Reserve. In addition, the plan recommends that the Secretary add the Pik Dunes to the Teshekpuk Lake Special Area and the upper reaches of the Kikiakrorak and Kogosukruk Rivers (and certain tributaries of the latter) to the Colville River Special Area in recognition of the surface values of these areas.

The planning process identified caribou calving and insect-relief habitat, specifically that for the Teshekpuk Lake Caribou Herd, as meriting special management consideration. This herd is important for area residents' subsistence. For example, approximately a third of the subsistence diet of Nuiqsut residents comes from caribou. The plan prohibits permanent oil and gas facilities and seasonal exploratory and delineation wells in the great majority of the Teshekpuk Lake Caribou Herd's calving and insect relief habitat. Under the plan, permanent oil and gas surface facilities would not be allowed in the vast majority of the most valuable



caribou habitat, including movement corridors at pinch-points east and northwest of Teshekpuk Lake. In the part of the caribou calving habitat in which oil surface facilities will be allowed, special stipulations have been formulated to mitigate disturbance to the habitat or delay or deflection of caribou movements.

Fish is another important subsistence resource. Besides establishing stipulations which protect the water resource throughout the planning area (e.g., limits on water withdrawals from fish-bearing streams and lakes, refueling setbacks from stream and lake banks), the plan will forbid permanent oil and gas facilities in or within a 1/4 mile of certain deep water lakes used by fish. There are also similar, but in some cases larger, setbacks from several streams identified as important by North Slope subsistence users. These setbacks, such as from Fish and Judy Creeks and the Miguakiak River, help assure subsistence users' access to important subsistence areas and that fish and game in these areas are not disturbed.

The goose molting habitat north and east of Teshekpuk Lake merits special protection. It is the most important molting habitat in the Arctic, accounting for substantial numbers of Pacific flyway bird molting populations; up to 23 percent of brant molt in the area. During the flightless molting stage, the birds are extremely sensitive to disturbance. They must simultaneously grow new feathers and build up their reserves of energy to prepare for their long fall migration south. As a consequence, the plan prohibits oil and gas leasing in nearly all of the molting habitat in the planning area, and forbids permanent oil and gas facilities throughout the entire molting habitat.

The plan also offers special protection for raptor habitat. The bluffs of the Colville River and two of its tributaries, the Kikiakrorak and Kogosukruk Rivers, are important habitat for raptor species, including peregrine falcons which were on the threatened and endangered species list until 1994. Permanent oil and gas facilities will generally be prohibited under the plan from an area within a mile of these bluffs and the Colville River Management Plan will further address the need for protecting this important habitat.

In order to better manage the planning area, there is a need for additional information on animal populations and their habitats, the impacts of human activities on those populations and their habitats, and the effectiveness of various mitigating measures. The plan endorses additional research and monitoring and calls for the creation of an Research and Monitoring Team to coordinate this work.

The plan does not alter BLM's obligation to convey lands to the State of Alaska and to Native corporations and individuals, in accordance with the Alaska Statehood Act, the Alaska Native Claims Settlement Act (ANCSA), and the Native Allotment Act. The plan, however, does acknowledge the ANCSA selection rights of Kuukpik Corporation. To minimize the chance



that lands will be conveyed to the corporation encumbered with oil and gas leases, the plan calls for BLM to withhold from the first lease sale up to approximately 42,000 acres (twice Kuukpik's remaining entitlement) which are identified by the corporation.



## ANILCA Section 810 Summary

The Alaska National Interest Lands Conservation Act (ANILCA) § 810(a) requires that a subsistence evaluation be completed for this IAP/EIS. The ANILCA also requires that this evaluation include findings on three specific issues:

1. the effect of such use, occupancy, or disposition on subsistence uses and needs;
2. the availability of other lands for the purposes sought to be achieved; and
3. other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (16 U.S.C. § 3120(a)).

The following discussion summarizes the ANILCA § 810 evaluation for the Preferred Alternative which was set out in greater detail in Appendix D of the Final IAP/EIS. The minor clarifications and modifications of the plan described in Appendix A of this ROD were also reviewed and found to have no effect which would change the subsistence evaluation and findings. Many of the changes only clarify language, while not changing the substance of the decision; change administrative arrangements with no substantial environmental impact; or allow changes in on-the-ground management under stringent conditions which would result in no substantial environmental impact.

- a. *Without the Cumulative Case:* The effects of the plan adopted in this ROD fall below the “may significantly restrict” threshold, which is the test for a positive finding under ANILCA § 810. The impacts to subsistence resources and uses for this alternative are minimal. This finding applies to villages in and near the planning area and to subsistence users in other regions of Alaska, including southwestern Alaska.
- b. *With the Cumulative Case:* The effects of the cumulative case presented in Section IV.H of the Final IAP/EIS exceeds the “may significantly restrict” threshold, and thus a positive ANILCA § 810 determination must be made. Although the effects of the activities proposed under the plan adopted in this ROD fall below the threshold, adding them to those of the cumulative case results in a level of effects that “may significantly restrict” subsistence uses.

The ANILCA § 810(a) provides that no “withdrawal, reservation, lease, permit, or other use, occupancy or disposition of the public lands which would significantly restrict subsistence uses shall be effected” until the Federal agency gives the required notice and holds a hearing in accordance with § 810(a)(1) and (2), and makes the three determinations required by § 810(a)(3)(A), (B), and (C). The BLM has found in this subsistence evaluation that all the



alternatives considered in this IAP/EIS (including the no-action alternative), when considered together with all the past, present, and reasonably foreseeable future cumulative effects discussed in the EIS, may significantly restrict subsistence uses. Therefore, BLM undertook the notice and hearing procedures required by ANILCA § 810(a)(1) and (2), as described above, and now must make the three determinations required by § 810(a)(3)(A), (B), and (C). 16 U.S.C. § 3120(a)(3)(A), (B), and (C).

We have determined that the plan meets the following requirements (16 U.S.C. § 3120(a)(3)(A), (B), and (C)) for Federal actions that may result in a significant restriction on subsistence uses:

1. *The significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands.*  
Only when considered together with cumulative effects of possible oil and gas activities on adjacent lands that are not under BLM's control, does the possibility exist that all the activities combined may significantly restrict subsistence uses. This possible restriction on subsistence uses could be lessened somewhat by not making any of the planning area available for oil and gas leasing, but this would not accomplish the management objectives for the planning area as guided by the statutory directives in the NPRPA, FLPMA, and other applicable laws, and for which the IAP was undertaken. The management principles under which the northeast NPR-A planning area is to be managed calls for an "expeditious program of competitive leasing of oil and gas" while providing for the protection of significant surface values, including environmental, fish and wildlife, historical, scenic and subsistence values. Moreover, even if BLM were to adopt the no-action alternative, the cumulative impacts on surrounding lands still would reach the may-significantly-restrict threshold under ANILCA § 810. The effects of the actions approved in this plan on subsistence resources and uses have been found to be very minimal. The BLM, therefore, has determined that the significant restriction that may occur under the plan when considered together with the cumulative case is necessary consistent with sound management principles for the utilization of these public lands.
2. *The proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition.*  
Given the legislative mandates cited above and the management objectives for which the IAP was undertaken, the process for determining which lands to offer for oil and gas leasing in the NPR-A did not focus solely on minimizing the total number of acres offered, although that was an important factor. Given economic limitations, that approach would have resulted in lease sales including more of the northernmost (highest prospect) part of the planning area, which might have



involved less total acres but which would have more intensively impacted the most critical habitat for subsistence resources. The plan instead combines prohibitions on leasing and oil and gas exploration and development on the most sensitive fish and wildlife lands with strict prohibitions on surface activities on other lands which are to be available for leasing. The restrictions on surface activities on both the leased and unleased lands protect fish and wildlife resources important to subsistence. It has been determined that the plan makes available the minimal amount of public lands necessary to carry out a successful leasing program at normal (\$18 a barrel) price levels while still excluding or restricting oil and gas leasing and surface activities in the areas most important for subsistence resources and uses. Offering an even smaller, more southerly portion of the planning area for leasing would be significantly less likely to lead to the development of economically viable stand alone fields, given the economics of operations in this remote area, distances from existing infrastructure, future variations in oil prices that must be anticipated, and the restrictions imposed on surface activities and facilities which increase environmental and subsistence protections but also increase the costs to industry.

3. *Reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.*

The plan, including its stipulations, provides many significant protections for subsistence uses and resources. These include restrictions on activities by oil and gas lessees, such as forbidding permanent oil and gas facilities in important subsistence use areas, including Teshekpuk Lake, the Miguakiak River, Fish and Judy Creeks, and near known long-term cabins and campsites. In addition, consultation with North Slope communities, the NSB, and the Subsistence Advisory Panel (an organization specifically established by the plan to advise BLM on matters of concern for subsistence users) must precede approval of oil and gas exploration and development permits. Stipulations also protect subsistence resources and their habitats through a multitude of restrictions on human activities in the planning area. Examples include stipulations regulating use and disposal of contaminants which could damage habitat, setbacks for certain activities from streams and lakes, and seasonal and spacial restrictions on activities near caribou calving areas. Roads linking the planning area to the infrastructure to the east have been prohibited, thus avoiding competition for subsistence resources from outsiders that improved access to the area might bring. The plan as a whole has been found to have only minimal impacts on subsistence resources and uses. Consequently, it has been determined that reasonable steps will be taken to minimize adverse impacts on subsistence uses and resources.







## **Mitigation and Monitoring**

Stipulations designed to protect the resources and uses of the planning area are listed in Appendix B. These stipulations include restrictions and guidelines on waste and spill prevention, handling, and disposal; overland moves and seismic surveys; oil and gas exploratory drilling, facility design, construction, and field abandonment; ground and air transportation; and other activities. They also contain additional special stipulations to protect subsistence resources and activities and traditional land use sites. Additional protective measures may be developed as part of NEPA evaluations of subsequent site-specific authorizations, including exploration and development plans, and of any second or subsequent oil and gas lease sales. It has been determined that all practical means to avoid or minimize environmental harm from the Preferred Alternative (as slightly modified by this ROD) have been adopted in this IAP/EIS.

Monitoring will be undertaken to determine the status of the various resources in the planning area, to ensure compliance with and enforcement of plan decisions and with stipulations attached to separate land use authorizations, and to measure the effectiveness of protective measures. The Research and Monitoring Team will help guide the monitoring effort in the planning area.







## **Public Involvement**

The public and other government agencies have provided valuable comments throughout the planning process. The public outreach effort is described in Sections V and VI of the Final IAP/EIS. This effort included:

- A 30-day scoping period (later extended to more than 60 days) began February 13, 1997, with the issuance of the Notice of Intent to prepare the Northeast NPR-A IAP/EIS. More than 175 people attended five scoping meetings in Alaskan communities in March and April and BLM received 101 written scoping comments.
- The BLM and the Minerals Management Service, which helped BLM develop the IAP/EIS, held a public NPR-A science symposium in April 1997 to gather the most current scientific information and traditional knowledge relevant to the planning area's resources and uses.
- Federal, State, and NSB agency personnel met in April 1997 to develop preliminary alternatives.
- In May 1997 Federal, State, and NSB biologists met to help formulate protective measures for caribou and waterfowl in the Teshekpuk Lake area.
- Federal, State, NSB, and North Slope tribal government representatives met in Nuiqsut in August 1997 to draft measures to protect subsistence resources and their uses. Public meetings were held in Nuiqsut and Barrow in conjunction with this subsistence workshop effort.
- The U.S. Geological Survey's Biological Survey Division coordinated a peer review of the descriptions of the affected environment and the environmental consequences sections of the IAP/EIS. In addition, State, NSB, and Fish and Wildlife Service personnel joined BLM and MMS staff in a final review of the document prior to printing the Draft IAP/EIS.

A 90-day review period was accorded the public on the Draft IAP/EIS. To facilitate communications from the public, comments were received by mail, e-mail, and via the BLM's NPR-A website. Also, public hearings were held in January 1998 on the IAP/EIS in Anaktuvuk Pass, Anchorage, Atkasuk, Barrow, Fairbanks, Nuiqsut, and Wainwright, Alaska, as well as Washington, D.C. and San Francisco. Upon the request of southwest Alaska residents, a subsistence hearing was held in Bethel and information meetings were held at Bethel and Hooper Bay. BLM received approximately 7,000 written comment messages and nearly 200 people testified at the public meetings on the Draft IAP/EIS. These comments were analyzed and the Final IAP/EIS reflected changes suggested by the commentors and responded to the comments offered on the draft.



- There was a 30-day comment period on the Final IAP/EIS. BLM received approximately 900 written comments by mail, e-mail, or over its internet website. The great majority of the respondents wrote to express opposition to oil and gas leasing in the planning area. They expressed essentially the same concerns as were enunciated during the comment period on the draft, and in addition commonly noted that the Preferred Alternative's proposal to lease up to 87 percent of the planning area did not strike a balance between development and surface resource protection. Other commentors offered specific suggestions for improvements and clarifications in the plan. We have considered these comments. Appendix A highlights the clarifications and slight modifications to the plan adopted as a result of these comments. Some responses raised concerns not aired during the comment period on the Draft IAP/EIS which have not resulted in changes. For example, some urged that we develop new regulations governing management of the Special Areas. We have not done so. The management plan itself sets management direction for the Special Areas so new regulations are not necessary. Some commentors stated that the pipeline will be worn out before NPR-A oil could pass through it, and asserted that our analysis should have included an assessment of impacts of the reconstruction of the pipeline. Pipeline maintenance and repair is on-going, but no special reconstruction is anticipated to bring NPR-A oil to market. Some commentors urged that exploratory drilling be allowed in the No Surface Activity area generally east, south, and west of Teshekpuk Lake. It has been determined, however, that the surface resources of the area merited the protection assured by this prohibition.



## **Appendix A**

# **Modifications and Clarifications**

The following list highlights clarifications and minor modifications in the Preferred Alternative as presented in the Final IAP/EIS adopted in this ROD.

1. Some commentors stated that non-governmental groups could contribute important expertise and perspective to a Research and Monitoring Team. We agree and have revised the ROD to broaden participation on it. The ROD drops "Interagency" from the Interagency Research and Monitoring Team's title proposed in the Final IAP/EIS, describes the Research and Monitoring Team as one composed of "representatives from Federal, State, and NSB agencies, the oil industry, environmental groups, academia, and other interested parties," and notes that this team will be chartered in accordance with the Federal Advisory Committee Act. This will allow the BLM to better benefit from the information and insights of a broad range of expertise. This change in the composition of the Research and Monitoring Team will have no substantial impacts relevant to the environment; through the integration of greater knowledge from the broader membership, impacts may, in fact, be further reduced.
2. Some commentors noted that the prohibition on exploratory drilling in lakes included in stipulation 28 may force drilling onto less environmentally desirable locations. There are some lakes in the planning area that do not support a fish community or abundant or diverse summer bird populations. These are commonly shallow lakes which freeze to the bottom by mid winter and many are isolated and not hydrologically connected to adjacent wetlands. Two new sentences are added to the end of this stipulation to make it clear that exceptions are allowed in certain limited circumstances set out in the sentences. Under the very limited circumstances in which this exception might be allowed, this is an insubstantial change relevant to environmental concerns because an exception may be authorized only where it would be environmentally preferable to maintaining the restriction and few resources are put at risk.
3. The North Slope Borough requested that decisions regarding the applicability of setbacks near known, long-term cabins and campsites as described in stipulations 23, 26, and 47 be a matter addressed in the consultation process described in stipulation 61. This would help assure that protection of these sites is provided in appropriate cases and that the AO will be better informed of cases in which the



setbacks might be waived without harm, such as when a cabin or campsite is not going to be in use during the period when winter seismic operations or exploratory drilling might occur. We have added language to each of these stipulations to bring them within the consultation process described in stipulation 61. We have also added a paragraph in stipulation 61 so that the consultation process for cabins and campsites is triggered by geophysical (i.e. seismic) permitting, as well as by exploration and development and production plans. This expansion of the consultation process would have no substantially changed effects relevant to the environment; indeed, by better informing the AO of the situation on the ground, it should improve management of these public lands.

4. Some commentors suggested that the consultation process for subsistence concerns near important wildlife, especially raptor, habitat near the Colville River and some of its tributaries should be expanded to also address wildlife concerns. This had been our intention, but the Final IAP/EIS did not reflect this. We have added a paragraph to the end of stipulation 62 to address this oversight. This expansion of the consultation process would have no substantial effects relevant to the environment; indeed, by better informing the AO of the situation on the ground, it should improve management of these public lands.
5. We received a suggestion that stipulation 27 be modified to specifically state that gravel pads will not be constructed for oil and gas exploration. This had been our intent; we assumed permanent facilities to include gravel pads. We believe that gravel pad construction for exploration is highly unlikely, as well as environmentally undesirable. The oil industry has indicated that it uses ice pads for such operations. To assure that no deviation from this practice occurs, we have specifically prohibited constructing gravel pads for exploratory drilling operations. This modification in the language of the stipulation will have no substantial effects relevant to environmental concerns since it simply clarifies a prohibition already assumed to be in place.
6. Language has been modified in the plan to clarify the deferral from leasing of lands the Kuukpik Corporation identifies. It was not our intention to require that Kuukpik commit to take its ANCSA selections from the lands it identifies prior to the first lease sale. The revised language describing the plan decision relevant to the Kuukpik Corporation Entitlement area clarifies this point, while retaining the limitation on the amount of land Kuukpik may ask to have deferred, i.e. twice its remaining entitlement. This clarification would have no substantial effects relevant to environmental concerns since the lands are still deferred from the first sale as indicated in the plan's prescribed management.



7. The Final IAP/EIS intentionally did not prohibit seismic operations and included stipulations 23 and 24 to provide guidelines on how seismic activities are to be conducted. Furthermore, in describing the Preferred Alternative, the Final IAP/EIS stated explicitly that seismic work would be permitted in the Teshekpuk Lake Special Protection Area and cites seismic operations as one of a number of authorized activities which shall comply with the stipulations. The Final IAP/EIS, however, inadvertently failed to state our intent that seismic operations be allowed throughout the planning area subject to stipulations. To assure that there is no confusion on this point, we have made a technical correction clarifying that seismic work will be allowed. This clarification will have no substantial effects relevant to the environment, since it does not reflect any change in the plan's prescribed management.
8. The Final IAP/EIS mistakenly indicated that four tributaries of the Kikiakrorak River, rather than the Kogosukruk River, were included in a 1-mile setback for oil and gas facilities described in stipulation 39 and the 2-mile consultation zones described in stipulation 62. Stipulations 39h, 39i, 62f, and 62g have been modified to correct this. This technical correction will have no impact relevant to the environment, since it does not reflect any change in the plan's prescribed management.
9. The Final IAP/EIS mistakenly used inconsistent language in describing prohibitions on permanent oil and gas facilities in the Teshekpuk Lake Surface Protection Area. Stipulation 31 has been reworded to accurately reflect the prohibitions stated in the description of the plan. This clarification will have no impacts relevant to the environment, since it does not reflect any change in the plan's prescribed management.
10. The final paragraph of stipulation 39 has been clarified to make it clearer that no exceptions will be granted to allow pipeline or road crossings in the Teshekpuk Lake setback area or road crossings in the the Colville River setback area. This clarification will have no substantial impacts relevant to environmental concerns because it makes no change in the plan's prescribed management.
11. The ROD adds language to stipulation 48 to clarify the intent that roads from the planning area to areas outside the area, including docks, are prohibited by the plan and no exceptions will be granted. It also has been reworded to reflect the Final IAP/EIS's intention that roads within an oil and gas field must be constructed to minimize environmental impacts and that roads between fields can only be approved after public comment and consultation with appropriate resource



agencies. These clarifications will have no substantial effect relevant to environmental concerns because they simply add consultation and make no changes in the plan's prescribed management.



## Appendix B

# Stipulations

The following definitions apply to the following stipulations:

**Active Floodplain:** The lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum that area subject to a 1 percent or greater chance of flooding in any given year (also referred to as the 100-year or base floodplain).

**Body of Water or Waterbody:** A lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life.

**Permanent oil and gas facilities:** Production facilities, pipelines, roads, airstrips, production pads, docks and other bottom-founded structures, seawater-treatment plants, and any other structure associated with an oil and gas operation that occupies land for more than one winter season. It does not include material sites or seasonal facilities such as ice roads and ice pads.

The following stipulations are based on existing policies and laws, and on knowledge of the resources present in the planning area and current industry practices. All stipulations will attach to all activities, including oil and gas leases issued in the planning area. All oil and gas activity permits issued subsequent to leasing shall comply with the appropriate lease stipulations specific to the activity under review. All permits issued in conjunction with other authorized activities (e.g., seismic operation, commercial guiding) within the planning area shall comply with the appropriate stipulations specific to the activity under review.

Additional site-specific stipulations may be added by the Authorized Officer (AO) as determined necessary by further NEPA analysis and as developed through consultation with other Federal, State, and NSB regulatory and resource agencies. Other Federal, State, and NSB permits (e.g., NPDES, Clean Water Act [CWA] Section 404) also may be required by law or regulation for an oil and gas project to proceed. A list of permits/approvals commonly required in conjunction with an oil and gas exploration and development project is provided in Table II.F.1 of the Final IAP/EIS. (All references to tables and figures in these stipulations are to the tables and figures in the Final IAP/EIS. Also see the Final IAP/EIS for maps of Land Use Emphasis Areas (LUEAs) referred to in these stipulations.) Additional permits not listed in Table II.F.1 may be required. Specific State permits are required when the State has primary authority, under Federal or State law or regulation, for enforcement of the provision in question. Specific permits issued by Federal agencies other than BLM could include permit conditions that are more stringent than those presented below.

**Exception Clause:** In the event that an exception to a lease or permit stipulation is requested and before an exception may be granted, the AO shall find that implementation of the stipulation is:

1. a) technically not feasible or  
b) economically prohibitive or  
c) an environmentally preferable alternative is available, and
2. the alternative means proposed by the lessee fully satisfies the objective(s) of the stipulation.



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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In addition, prior to the consideration or granting of an exception to a lease or permit stipulation, all conditions and/or consultation requirements specific to a stipulation must be met. The AO shall consult with appropriate Federal, State, and NSB regulatory and resource agencies before an exception may be granted, except in the case of an emergency. The AO's power to grant stipulation exceptions is limited to those subjects, uses, and permits over which the BLM has authority. Exceptions may be granted in emergencies involving human health and safety.

### **Waste Prevention, Handling, and Disposal and Spills:**

1. To prevent and minimize present and future pollution, management decisions affecting waste generation shall be addressed in the following order of priority:
  - Prevention and Reduction
  - Recycling
  - Treatment
  - Disposal
  - a. Lessees shall prepare a waste-management plan approved by the AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, to achieve specific waste-reduction and prevention goals for all phases of exploration and development (including activities conducted by contractors). The plan shall identify all waste streams that will be produced during each operation by type, volume, and toxicity and the method of disposal. For each waste stream, the lessee/operator shall describe what actions will be taken to minimize the volume. The plan should include activities that will integrate pollution prevention concepts into purchasing, inventory, shipping/receiving, operations maintenance, training, accounting, and design. The goal of the plan shall be continuous environmental improvement and achievement of reduction goals developed through the planning process. Lessees shall develop schedules for implementation and review to meet reduction and prevention goals, designate accountable personnel to carry out action items, and specify budget line items for plan elements. Lessees shall provide the AO with an annual waste-management report.
  - b. Lessees shall implement a hazardous-materials tracking system to ensure proper use, storage, and management of materials being used within industrial processes. The use of chlorinated solvents is prohibited.
  - c. Lessees shall conduct annual environmental compliance audits.
2. Attracting wildlife to food and garbage is prohibited. All feasible precautions shall be taken to avoid attracting wildlife to food and garbage. A current list of approved precautions, specific to type of permitted use, can be obtained from the AO. Lessees and permitted users shall have a written procedure to ensure that the handling and disposal of putrescible waste will be accomplished in a manner to prevent the attraction of wildlife.
3. Burial of garbage is prohibited. All putrescible waste shall be incinerated or composted through an AO-approved system, unless otherwise authorized by the AO. All solid waste, including incinerator ash, shall be removed from BLM lands and disposed of in an approved waste-disposal facility in accordance with U.S. Environmental Protection Agency (USEPA) and State of Alaska, Dept. of Environmental Conservation (ADEC) regulations and procedures. Burial of human waste is prohibited except as authorized by the AO.



4. Except as specifically provided, all pumpable solid, liquid, and sludge waste shall be disposed of by injection in accordance with USEPA, ADEC, and the Alaska Oil and Gas Conservation Commission regulations and procedures. On-pad temporary muds and cuttings storage will be allowed as necessary to facilitate annular injection and/or backhaul operations.
5. Wastewater disposal:
  - a. Unless authorized by the National Pollution Discharge Elimination System (NPDES) or State permit, disposal of domestic wastewater into bodies of freshwater, including wetlands, is prohibited.
  - b. Surface discharge of reserve-pit fluids is prohibited unless authorized by applicable NPDES, ADEC, and NSB permits and approved by the AO.
  - c. Disposal of produced waters in upland areas, including wetlands, will be by subsurface-disposal techniques. The AO, in consultation with the ADEC and USEPA, may permit alternate disposal methods, if the lessee demonstrates that subsurface disposal is not feasible or prudent.
  - d. Discharge of produced waters into open or ice-covered marine waters less than 33 feet (10 meters) in depth is prohibited. The AO in consultation with ADEC and USEPA may approve discharges into waters greater than 33 feet (10 meters) in depth based on a case-by-case review of environmental factors and consistency with the conditions of a NPDES permit.
  - e. Alternate disposal methods will require an NPDES permit certified by the State.
6. Areas of operation shall be left clean of all debris.
7. All spills shall be cleaned up immediately and to the satisfaction of the AO and all agencies with regulatory authority over spills, including the USEPA, ADEC, and the U.S. Coast Guard.
8. Notice of any spill shall be given to the AO as soon as possible. Other Federal, State, and NSB entities shall be notified as required by law.
9. For oil- and gas-related activities, a Hazardous-Materials Emergency-Contingency Plan shall be prepared and implemented prior to transportation, storage, or use of fuel. The plan shall include a set of procedures to ensure prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of a release. Procedures applicable to fuel handling (associated with transportation vehicles) may consist of Best Management Practices approved by the AO. The plan shall include a list of resources available for response (e.g., heavy-equipment operators, spill-cleanup materials or companies), and names and phone numbers of Federal, State, and NSB contacts. Other Federal and State regulations may apply and require additional planning requirements. All staff shall be instructed regarding these procedures.
10. Oil-spill-cleanup materials (absorbents, containment devices, etc.) shall be stored at all fueling points and vehicle-maintenance areas and be carried by field crews on all overland moves, seismic work trains, and similar overland moves by heavy equipment.
11. Lessees shall provide refresher spill-response training to NSB and local community spill-response teams on a yearly basis.
12. Lessees shall plan and conduct a major spill-response field-deployment drill annually.



13. Prior to production and as required by law, lessees shall develop spill prevention and response contingency plans and participate in development and maintenance of the *North Slope Subarea Contingency Plan for Oil and Hazardous Substances Discharges/Releases* for the NPR-A operating area. Planning shall include development and funding of detailed (e.g., 1:26,000 scale) environmental sensitivity index maps for the lessee's operating area and areas outside the lessee's operating area that could be affected by their activities. (The specific area to be mapped shall be defined in the lease agreement and approved by the AO in consultation with appropriate resource agencies). Maps shall be completed in paper copy and geographic information system format in conformance with the latest version of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's *Environmental Sensitivity Index Guidelines*. Draft and final products shall be peer reviewed and approved by the AO in consultation with appropriate Federal, State, and NSB resource and regulatory agencies.
14. Except during overland moves and seismic operations (see stipulation 24m), fuel, other petroleum products, and other liquid chemicals designated by the AO, whether in excess of 660 gallons in a single tank or in excess of 1,320 gallons in multiple containers, shall be stored within an impermeable lined and diked area capable of containing 110 percent of the stored volume. The liner material shall be compatible with the stored product and capable of remaining impermeable during typical weather extremes expected throughout the storage period. Permanent fueling stations shall be lined or have impermeable protection to prevent fuel migration to the environment due to overfills and spills. The storage area shall be located at least 500 feet from any waterbody with the exception of small caches (up to 210 gallons) for motor boats, float planes, and ski planes.
15. Fuels shall not be stored on the active floodplain of any waterbody. Although fuels may be off-loaded from aircraft on ice, fuels shall not be stored on lake or river ice.
16. Refueling of equipment within 500 feet of the highest high water mark of any waterbody is prohibited with the exception of refueling motor boats, float planes, and ski planes. (See stipulation 24n for restrictions related to overland moves and seismic operations.)
17. All fuel containers, including barrels and propane tanks, shall be marked with the responsible party's name, product type, and year filled or purchased.

**Ice Roads and Water Use:**

18. The location of winter ice roads shall be offset from year to year to minimize vegetative impacts. The offset shall be greater than or equal to the width of the road.
19. Compaction of snow cover or snow removal from fish-bearing waterbodies shall be prohibited except at approved ice-road crossings.
20. Water withdrawal from rivers and streams during winter is prohibited. Water withdrawal is prohibited during winter from lakes less than 7 feet ( 2.1 m) deep if they are interconnected with or subject to seasonal flooding by a fish-bearing stream. Water may be withdrawn from isolated lakes that are less than 7 feet (2.1 m) deep that lack connection to or are not subject to seasonal flooding by a fish-bearing stream. After consultation with the appropriate Federal, State, and NSB regulatory and resource agencies, the AO may authorize withdrawals from any lake less than 7 feet (2.1 m) deep, if the proponent demonstrates that no fish exist in the lake.



Generally, water withdrawal drawdown during winter from lakes 7 feet (2.1 m) deep or deeper shall be limited to 15 percent of the estimated free-water volume (i.e., excluding the ice). After consultation with the appropriate Federal, State, and NSB regulatory and resource agencies, the AO may authorize drawdown exceeding 15 percent from a lake greater than 7 feet (2.1 m) deep, if the proponent of the additional drawdown demonstrates that no fish exist in the lake. Operators are encouraged to use new ice-road and ice-pad construction methods, such as using aggregate "chips" shaved from frozen lakes, to decrease water demands, construction time, and impact on fisheries.

21. The AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, may allow water extraction from any lake used by molting geese, if it is determined that the withdrawal is consistent with stipulation 20 and will not adversely affect identified goose-feeding habitat along lakeshore margins. An analysis/demonstration of the hydrologic functions of the lake(s) under review may be required of the lessee by the AO prior to approval of the withdrawal.
22. Except for approved crossings, alteration of the banks of a waterway is prohibited. Waterways include natural features with sufficient water to create riparian (willow) habitat such as rivers, streams, deep and shallow lakes, tundra ponds, and shallow water tracks. Clearing of willows along the riparian zone is prohibited. Movement of equipment through willow stands shall be avoided whenever possible.

**Overland Moves and Seismic Work:**

23. Seismic work is prohibited within 1,200 feet of any known, long-term cabin or campsite, identified by the AO, without the written permission of the AO. The AO's decision will be informed by the consultation process described in stipulation 61.
24. The following restrictions apply to overland moves, seismic work, and any similar use of heavy equipment (other than actual excavations as part of construction) on unroaded surfaces during the winter season:
  - a. Because polar bears are known to den predominantly within 25 miles of the coast, operators shall consult with the Fish and Wildlife Service (FWS) prior to initiating activities in such habitat between October 30 and April 15. Activities are prohibited within 1 mile of known or observed polar bear dens; obtain locations from the FWS, (907) 786-3800. Operators are encouraged to apply for a letter of authorization from the FWS to conduct activities in polar bear denning areas.
  - b. Motorized ground-vehicle use will be minimized within the Colville River Raptor, Passerine, and Moose Area LUEA from April 15 through August 5, with the exception that use will be minimized in the vicinity of gyrfalcon nests beginning March 15. Such use will remain ½ mile away from known raptor-nesting sites, unless authorized by the AO. The BLM shall consult with FWS to plan travel routes to minimize disturbance to raptors.
  - c. Crossing of waterway courses shall be made using a low-angle approach to avoid disruption of the natural stream or lake bank. Except at approved crossings, operators are encouraged to travel a minimum of 100 feet from overwintering fish streams and lakes.
  - d. If snow ramps or snow bridges are used at water crossings for bank protection, the ramps and bridges shall be substantially free of soil and/or debris. Snow bridges shall be removed or breached immediately after use or before spring breakup.
  - e. To avoid additional freeze down of deep-water pools harboring overwintering fish, waterways shall be crossed at shallow riffles from point bar to point bar whenever possible.



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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- f. On-the-ground activities shall use low-ground-pressure vehicles such as Rolligons, ARDCO, Trackmaster, Nodwell, or similar types of vehicles. A current list of approved vehicles can be obtained from the AO. Limited use of tractors equipped with wide tracks or "shoes" will be allowed to pull trailers.
- g. Bulldozing of tundra, trails, or seismic lines is prohibited. This stipulation, however, does not prohibit the clearing of drifted snow along a trail, seismic line, or in a camp, to the extent that the tundra mat is not disturbed. Snow may be cleared from a waterbody ice surface to prepare an aircraft runway, if approved by the AO in consultation with appropriate Federal, State, and NSB regulatory and resource agencies.
- h. To reduce the possibility of ruts, vehicles shall avoid using the same trails for multiple trips unless necessitated by serious safety or superseding environmental concern. This provision does not apply to ice roads (see stipulation 18 above).
- i. Ground operations are to begin only after the seasonal frost in the tundra and underlying mineral soils has reached a depth of 12 inches, and the average snow cover is 6 inches deep. The exact date shall be determined by the AO.
- j. Ground operations shall cease when the spring melt of snow begins; approximately May 5 in the foothills area where elevations exceed 300 feet, and approximately May 15 in the northern coastal areas. The exact date will be determined by the AO.
- k. Seismic activities and overland moves within the Goose Molting LUEA and the Teshekpuk Lake Caribou Habitat LUEA from May 1 through September 30 are prohibited. (Note that this overrides language in stipulation 24j.)
- l. To prevent surface disturbance to tundra and other vegetation, tracked vehicles will not execute tight turns by locking one track.
- m. Operators shall use best available technology (e.g., self-contained containment systems) or other appropriate spill containment measures, approved by the AO, to prevent fuel migration from fuel or chemical storage areas to the environment due to overfills and spills.
- n. Refueling of equipment is prohibited within the active floodplain of any waterbody.

### **Oil and Gas Exploratory Drilling:**

- 25. From May 1 through September 30, exploratory drilling other than from production pads is prohibited in the Special Caribou Stipulations Area (Fig. II.C.1-1).
- 26. Exploratory drilling is prohibited within 1,200 feet of any known, long-term cabin or campsite, identified by the AO, without written permission of the AO. The AO's decision will be informed by the consultation process described in stipulation 61.
- 27. Permanent or gravel oil and gas facilities including roads shall not be constructed during the exploration phase of oil and gas development.
- 28. Exploratory drilling in river, stream, and lake beds, as determined by the highest high water mark, is prohibited. Exceptions to this stipulation may be authorized by the AO in cases of shallow lakes which freeze to the bottom, do not support significant fish or bird populations, and are hydrologically isolated. Further, such an exception may be granted only if it is environmentally preferable to maintaining the restriction.



**Facility Design and Construction:**

29. At least 3 years prior to approval of any development plan for leases within the Special Caribou Stipulations Area (see Fig. II.C.1-1), the lessee shall design and implement a study of caribou movement, including historical information regarding the distribution and range use of the Teshekpuk Lake Caribou Herd, as well as maps of caribou trails within the area. Study data may be gathered concurrent with approved seismic and exploration activity. The study design shall be approved by the AO in consultation with the Research and Monitoring Team. The study will include a minimum of 3 years of data to assist in providing the information necessary to determine facility design and location, including pipelines, that will be part of the development plan. Lessees may submit individual plans or they may combine with other lessees in the area to do a joint study. Total study funding by all lessees will not exceed \$500,000.
30. Causeways and docks are prohibited in river mouths or deltas. Artificial gravel islands and bottom-founded structures are prohibited in river mouths or active stream channels on river deltas, except as provided in the paragraphs below.

The BLM discourages the use of continuous-fill causeways. Environmentally preferred alternatives for field development include the use of onshore directional drilling, elevated structures, or buried pipelines. Approved causeways shall be designed, sited, and constructed to prevent significant changes to near shore oceanographic circulation patterns and water-quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedences of water-quality criteria, and must maintain free passage of marine and anadromous fish.

Causeways, docks, artificial gravel islands, and bottom-founded structures may be permitted if the AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, determines that a causeway or other structure is necessary for field development, and that no feasible and prudent alternative exists. A monitoring program may be required to address the objectives of water quality and free passage of fish. Additional mitigation shall be required where significant deviation from these objectives occurs.

31. Permanent oil and gas surface occupancy, including but not limited to permanent oil and gas facilities, pads, rigs, platforms, gravel roads, airstrips, pipelines, gravel or other material extraction sites, and exploration and delineation drilling facilities are prohibited in the Teshekpuk Lake Surface Protection Area (specifically, T. 13 N., Rs. 3-7 W., U.M.; Secs. 1-6, 8-16, 21-25, 36, T. 13 N., R. 8 W., U.M.; T. 14 N., Rs. 1-2 E. and Rs. 1-8 W., U.M.; Secs. 1-2, 11-14, T. 14 N., R. 9 W., U.M.; T. 15 N., Rs. 2-8 W., U.M.; Secs. 1-3, 7-30, 35-36, T. 15 N., R. 9 W., U.M.; T. 16 N., Rs. 2-8 W., U.M.; Secs. 1-6, 8-17, 21-27, 34-36, T. 16 N., R. 9 W., U.M.; T. 17 N., Rs. 1-9 W., U.M.; and T. 18 N., Rs. 2-8 W., U.M.). No exceptions will be granted to this stipulation.
32. Lessees shall use maximum economically feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads. New developments shall share facilities with existing development when prudent and technically feasible. All oil and gas facilities, except airstrips, docks, and seawater-treatment plants, will be collocated with drill pads. If possible, airstrips will be integrated with roads. Given the paucity of gravel sites in the planning area and the cost of transporting gravel from outside the planning area, lessees are encouraged to implement gravel-reduction technologies e.g., insulated or pile-supported pads.



33. Within the Special Caribou Stipulations Area (see Fig. II.C.1-1), lessees shall orient linear corridors when laying out oil field developments to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities.
34. Lessees shall separate elevated pipelines from roads by a minimum of 500 feet, if feasible. Separating roads from pipelines may not be feasible within narrow land corridors between lakes and where pipe and road converge on a drill pad.
35. To minimize delay or deflection of caribou movements, lessees shall place pipeline on the appropriate side of the road as determined by the AO (depending on general caribou movements in the area).
36. In the Special Caribou Stipulations Area (see Fig. II.C.1-1) and where facilities or terrain may funnel caribou movement, ramps over pipelines, buried pipe, or pipe buried under the road may be required by the AO after consultation with appropriate Federal, State, and NSB regulatory and resource agencies.
37. Aboveground pipelines shall be elevated at least 5 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a road, pad, or a ramp installed to facilitate wildlife passage and subsistence passage and access. The AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, may make an exception if no feasible and prudent means exists to meet the requirement.
38. All crude oil, produced water, seawater, and natural gas pipelines shall be constructed to accommodate the best available technology for detecting corrosion or mechanical defects during routine structural integrity inspections.
39. Permanent oil and gas facilities, including roads, airstrips, and pipelines, are prohibited within and adjacent to the waterbodies listed below at the distances identified to protect fish and raptor habitat, cultural and paleontological resources, and subsistence and other resource values. Setbacks include the bed of the waterbody and are measured from the bank's highest high water mark.
  - a. **Ikpikpuk River:** a ½-mile setback from the bank of the Ikpiupuk River within the planning area (fish, raptors, subsistence, cultural, and paleontological resources).
  - b. **Miguakiak River:** a ½-mile setback from each bank of the Miguakiak River (fish and subsistence resources).
  - c. **Teshekpuk Lake:** a ½-mile setback from the bank and around the perimeter of Teshekpuk Lake (fish and subsistence resources).
  - d. **Fish Creek:** (1) a 3-mile setback from each bank of Fish Creek downstream from Section 31, T11N, R1E; (2) a ½-mile setback from each bank of Fish Creek in and upstream from Section 31, T11N, R1E (fish and subsistence resources).
  - e. **Judy Creek:** a ½-mile setback from each bank of Judy Creek extending from the mouth to the confluence of an unnamed tributary in Sec. 8, T8N., R.2W., Umiat Meridian (fish and subsistence resources).
  - f. **Colville River:** a 1-mile setback from the western bluff (or bank if there is no bluff) of the Colville River extending the length of the river as described in the Colville River Raptor, Passerine, and Moose LUEA. This restriction does not apply within 1½ mile of the Umiat airstrip (fish, raptor, passerine, moose, paleontological, subsistence, scenic, and recreational resources).



- g. **Deep Water Lakes:** a ¼-mile setback around the perimeter of any fish-bearing lake within or partially within the deep lake zone (see Fig. II.B.5) (fish resources). (If the fish-bearing status of the waterbody is unknown, the burden is on the lessee to demonstrate whether fish are present.)
- h. **Kikiakrorak River:** a 1-mile setback from each bluff (or bank if there is no bluff) of the Kikiakrorak River downstream from T.2 N, R. 4 W., Umiat Meridian (raptor, passerine, and moose resources).
- i. **Kogosukruk River:** a 1-mile setback from each bluff (or bank if there is no bluff) of the Kogosukruk River (including the four tributaries off the southern bank) downstream from T.2 N., R.3W., Umiat Meridian (raptor, passerine, and moose resources).

On a case-by-case basis, essential pipeline and road crossings will be permitted, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, through setback areas in those instances where no other suitable sites are available. Stream crossings will be sited perpendicular to the main channel flow; lake crossings will be at the narrowest point. Pipeline and road crossings are prohibited in the setback around Teshekpuk Lake, with no exceptions. Road crossings are prohibited in the setback adjacent to the Colville River with no exceptions.

- 40. Gravel mining sites required for development activities will be restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage. Where feasible and prudent, gravel sites shall be designed and constructed to function as water reservoirs for future use. Gravel mine sites are prohibited within the active floodplain of a river, stream, or lake unless the AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, determines that there is no feasible and prudent alternative or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed and the site is closed.

Mine site development and rehabilitation within a floodplain shall follow the procedures outlined in McLean (1993), North Slope Gravel Pit Performance Guidelines; State of Alaska, Dept. of Fish and Game (ADF&G) Habitat and Restoration Division Technical Report 93-9.

- 41. For those waterbodies not listed in stipulation 39, permanent oil and gas facilities, including roads, airstrips, and pipelines, are prohibited upon or within 500 feet as measured from the highest high water mark of the active floodplain. Essential pipeline and road crossings will be permitted on a case-by-case basis.
- 42. Bridges, rather than culverts, shall be used for any allowed road crossings on all major rivers, including those waterbodies listed in stipulation 39 or identified by the AO in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, to reduce the potential of ice-jam flooding and erosion. When necessary on smaller streams, culverts shall be large enough to avoid restriction of fish passage or adversely affecting natural stream flow.
- 43. The natural drainage pattern will be identified prior to and maintained during and after construction. All permanent structures constructed adjacent to a body of water, such as approved road and pipeline crossings, shall be sited and designed to limit erosion from flooding and wave action (e.g., through use of slope-protection measures). Cross-drainage structures will be sited, maintained, and properly abandoned to prevent impoundments or alteration of local or areawide hydrology. Gravel structures shall be designed and sited to minimize the length that is perpendicular to sheet flow.



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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44. Dewatering during construction shall be conducted using Best Management Practices (BMP's). A current list of BMP's will be available from the AO. Examples include the use of splash plates, dewatering points, natural filtration through vegetation, and dewatering during low-water period.
45. No surface structures, except essential transportation crossings, are allowed within the Pik Dunes LUEA.
46. Lessees shall minimize the impact of industrial development on key wetlands. Key wetlands are those wetlands that are important to fish, waterfowl, and shorebirds because of their high value or scarcity in the region. Lessees shall identify on a map or aerial photograph the largest surface area, including future expansion areas, within which a facility is to be sited or an activity is to occur. The AO will consult with Federal, State, and NSB regulatory and resource agencies to identify key wetlands and work with lessees during the development of operating plans. To minimize impact, the lessee shall avoid siting facilities in the identified wetlands, unless no feasible and prudent alternative exists. Key wetland types include but are not limited to fish-bearing lakes and streams, riparian shrub, and the following classes described by Bergman et al. (1977): shallow and deep-*Arctophila* ponds, deep-open lakes, basin-complex wetlands, and coastal wetlands.
47. Permanent oil and gas facilities are prohibited within 1 mile of known long-term cabins or long-term campsites, identified by the AO, except that pipelines and roads are allowed up to ¼ mile from such cabins or campsites. The AO's decision will be informed by the consultation process described in stipulation 61.
48. Permanent roads (i.e. gravel, sand) connecting to a road system or docks outside the planning area are prohibited, and no exceptions may be granted. Permanent roads necessary to connect pads within independent, remote oil fields are allowed but they must be designed and constructed to create minimal environmental impacts. Roads connecting production sites between separate oil fields may be considered if road-connected operations are environmentally preferable to independent, consolidated operations that each include airstrip, housing, production, and support facilities. This exception will only be granted following consultations with appropriate Federal, State, and NSB regulatory and resources agencies, and the appropriate level of NEPA review.

### **Ground Transportation:**

49. The following ground-traffic restrictions apply to permanent roads (as authorized in stipulation 48 above) in the Special Caribou Stipulations Area (Fig. II.C.1-1):
  - a. From May 20 through June 20:
    - (1) Traffic speed will not exceed 15 miles per hour.
    - (2) Traffic will be minimized (a reasonable target would be four convoy round-trips per day between facilities). Nonessential operations requiring vehicles shall be suspended during this time period.
  - b. From May 20 through August 1:
    - (1) Caribou movement will be monitored.
    - (2) Based on this monitoring, traffic will cease when a crossing by 10 or more caribou appears to be imminent.



c. From May 20 through August 20:

- (1) Convoying will be used to minimize the number of disturbances due to road traffic.
- (2) Personnel will be bussed between work sites and other facilities to minimize the number of vehicles on the road.

50. Major stockpiling of equipment, materials, and supplies for oil and gas activities in the Special Caribou Stipulations Area (see Fig. II.C.1-1) shall occur prior to or after the period May 20 through June 20 to minimize road traffic during that period.

51. Chasing wildlife with ground vehicles is prohibited.

**Air Traffic:**

(Note: The BLM's authority to restrict air traffic is limited to those activities associated with use authorization on BLM-administered lands.)

52. Use of aircraft larger than a Twin Otter for authorized activities in the planning area, including oil and gas activities, from May 20 through August 20 within the Teshekpuk Lake Caribou LUEA (see Fig. II.B.4) is prohibited, except in cases of emergency.

53. Helicopter overflights for BLM-permitted activities shall be suspended in the Goose Molting LUEA (see Fig. II.B.2) from June 15 through August 20.

54. Fixed-wing aircraft traffic takeoffs and landing for BLM-permitted activities in the planning area shall be limited to an average of one round-trip flight a day from May 20 through June 20 at aircraft facilities in the Teshekpuk Lake Caribou Habitat LUEA (see Fig. II.B.4). Within the Goose Molting LUEA (see Fig. II.B.2), fixed-wing aircraft use for such activities shall be restricted from June 15 to August 20 to flight corridors and frequencies established by BLM in consultation with the appropriate Federal, State, and NSB regulatory and resource agencies.

55. Aircraft shall maintain an altitude of at least 1,000 feet above ground level (AGL) (except for takeoffs and landings) over caribou winter ranges from October 1 through May 15 and 2,000 feet AGL over the Teshekpuk Lake Caribou Habitat LUEA (see Fig. II.B.4) from May 16 through July 31, unless doing so would endanger human life or violate safe flying practices.

56. Aircraft shall maintain an altitude of at least 1,500 feet AGL when within ½ mile of cliffs identified as raptor nesting sites from April 15 through August 5, unless doing so would endanger human life or violate safe flying practices. Aircraft shall maintain an altitude of 1,500 feet AGL when within ½ mile of known gyrfalcon nest sites from March 15 to April 15. Permittees shall obtain information from BLM necessary to plan flight routes near gyrfalcon nests.

57. Hazing of wildlife by aircraft is prohibited.



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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### **Oil Field Abandonment:**

58. Upon field abandonment or expiration of a lease or oil- and gas-related permit, all facilities shall be removed and sites rehabilitated to the satisfaction of the AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies. The AO may determine that it is in the best interest of the public to retain some or all of the facilities. Lessees shall comply with all exploration and development bonding required by law and regulation (43 CFR 3154.1 and 3134.1). No exceptions shall be granted to this provision.

### **Subsistence:**

59. During exploration, development, and production, the lessee shall develop and implement a plan, approved by the AO in consultation with the Research and Monitoring Team and the Subsistence Advisory Panel, to monitor the effects of activities on subsistence. The lessee shall provide biannual reports to BLM, the Research and Monitoring Team, and the Subsistence Advisory Panel.
60. Lessees shall not unreasonably restrict access by subsistence users in oil field development areas.
- a. Lessees shall establish procedures for entrance to facilities, the use of roads, and firearms discharge. These procedures shall be developed in consultation with affected local communities, NSB, and the Subsistence Advisory Panel and be approved by the AO. In cases where the lessee and the Panel disagree, the AO will determine the appropriate procedure.
  - b. Lessees shall develop and distribute information about how to conduct subsistence activities in development areas safely (so equipment is not damaged and people are not endangered) to the communities through public meetings, newsletters, radio, and signs in both English and Inupiaq.
61. Exploration and development and production operations shall be conducted in a manner that prevents unreasonable conflicts between the oil and gas industry and subsistence activities.

Prior to submitting an exploration plan or development and production plan (including associated oil-spill contingency plans) to the BLM, the lessee shall consult with potentially affected subsistence communities (e.g., Barrow, Nuiqsut, Atkasuk, or Anaktuvuk Pass), NSB, and the Subsistence Advisory Panel to discuss potential conflicts with the siting, timing, and methods of proposed operations and safeguards or mitigating measures that could be implemented by the operator to prevent unreasonable conflicts. Through this consultation, the lessee shall make every reasonable effort, including such mechanisms as a conflict avoidance agreement, to ensure that exploration, development, and production activities are compatible with subsistence hunting, fishing, and other subsistence activities and will not result in unreasonable interference with subsistence harvests.

A discussion of resolutions reached during this consultation process, specific conflict avoidance agreement(s), and plans for continued consultation shall be included in the permit application, exploration plan, or the development and production plan. In particular, the lessee shall show in the plan how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence activities. Lessees also shall include a discussion of multiple or simultaneous operations, such as exploration and delineation well drilling and seismic activities, that can be expected to occur during operations to more accurately assess the potential for any cumulative effects. Communities, individuals, and other entities who were involved in the consultation shall be identified in the application or plan. The AO shall send a copy of the exploration plan or development and production plan



(including associated oil-spill-contingency plans) to the potentially affected communities, the NSB, and the Subsistence Advisory Panel at the time they are submitted to the BLM to allow concurrent review and comment as part of the plan approval process.

In the event no agreement is reached between the parties, the AO shall consult with representatives from the subsistence communities, Subsistence Advisory Panel, NSB, and the lessee(s) to specifically address the conflict and attempt to resolve the issues before making a final determination on the adequacy of the measures taken to prevent unreasonable conflicts with subsistence harvests.

The lessee shall notify the AO of all concerns expressed by subsistence users during operations and of steps taken to address such concerns. Lease-related use will be restricted, when the AO determines it is necessary to prevent unreasonable conflicts with local subsistence hunting, fishing, and other subsistence activities.

In enforcing this stipulation, the AO will work with other agencies and the public to assure that potential conflicts are identified and efforts are taken to avoid these conflicts, e.g., planning seismic operations to avoid traditional land use sites and allotments. These efforts may include seasonal drilling restrictions, seismic restrictions, and directional drilling requirements or use of other technologies deemed appropriate by the AO.

The consultation process described in this stipulation will also be required of applicants for geophysical (i.e. seismic) permits to address potential conflicts with the setback requirements for cabins and campsites described in stipulation 23. This consultation will help provide information to the AO on the advisability of modifying or waiving the restriction on seismic activity identified in stipulation 23.

62. The following subsistence, wildlife habitat, and traditional/cultural land use areas are of significant concern to local communities and will be given special consideration during the consultation process outlined in stipulation 61:

- a. **Long-term cabins and campsites:** a 2-mile zone around the cabins and campsites.
- b. **Ikpikpuk River:** a 2-mile zone from the east bank of the river.
- c. **Miguakiak River:** a 3-mile zone from each bank of the river.
- d. **Fish Creek:** (1) a 3-mile zone from each bank downstream from Sec. 31, T11N, R1E; (2) a 2-mile zone from each bank in and upstream from Section 31, T11N, R1E.
- e. **Judy Creek:** a 2-mile zone from each bank of the creek.
- f. **Kogosukruk River:** a 2-mile zone from each bluff (or bank if there is no bluff) of the river (including the four tributaries off the southern bank) downstream from T. 2 N., R. 3 W., Umiat Meridian.
- g. **Kikiakrorak River:** a 2-mile zone from each bluff (or bank if there is no bluff) of the river downstream from T. 2 N., R. 4 W., Umiat Meridian.
- h. **Colville River:** a 2-mile zone from the west bluff (or bank if there is no bluff) extending the length of river in the Colville River Raptor, Passerine, and Moose LUEA.

In addition, a permittee or lessee engaged in oil and gas-related activity shall consult with the BLM, FWS, ADF&G, and the NSB regarding wildlife concerns prior to submitting a geophysical (i.e. seismic) permit, exploration plan, or development and production plan involving activity within the 2-mile zones around the Kogosukruk (and its tributaries), Kikiakrorak, and Colville Rivers described above. In the event that the permittee or lessee and the agencies are unable to reach agreement on steps necessary to address wildlife



## *Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement*

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concerns, the AO will consult with the other agencies and the permittee or lessee before making a determination on the adequacy of the measures taken to prevent conflicts with wildlife.

### **Orientation Program:**

63. The lessee shall include in any application for permit to drill a proposed orientation program for all personnel involved in exploration or development and production activities (including personnel of lessee's agents, contractors, and subcontractors) for review and approval by the AO. The program shall be designed in sufficient detail to inform individuals working on the project of specific types of environmental, social, and cultural concerns that relate to the planning area. The program shall address the importance of not disturbing archaeological and biological resources and habitats, including endangered species, fisheries, bird colonies, and marine mammals and provide guidance on how to avoid disturbance. Guidance shall include the production and distribution of information cards on endangered and/or threatened species in the planning area. The program shall be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which personnel will be operating. The orientation program shall also include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation.

The program shall be attended at least once a year by all personnel involved in on-site exploration or development and production activities (including personnel of lessee's agents, contractors, and subcontractors) and all supervisory and managerial personnel involved in lease activities of the lessee and its agents, contractors, and subcontractors. Individual training is transferable from one facility to another except for elements of the training specific to a particular site.

Lessees shall maintain a record onsite of all personnel who attend the program for so long as the site is active, though not to exceed the 5 most recent years of operations. This record shall include the name and dates(s) of attendance of each attendee.

### **Traditional Land Use Sites:**

64. Lessees shall conduct an inventory of known traditional land use sites prior to any field activity. This inventory will be compiled from sites listed in the most current Traditional Land Use Inventory available from the NSB's Inupiat History, Language, and Cultural Commission, and shall be approved by the AO. Based on this inventory, the lessee shall develop a plan to avoid these sites and mitigate any potential damage that could result from field activities. The plan shall indicate how access to the site by local subsistence users will be provided. Lessees shall submit copies of the plan to BLM and the Subsistence Advisory Panel with any application for permit to drill.

### **Other Activities:**

65. It is the responsibility of the authorized user to ensure that all individuals brought to the planning area under its auspices adhere to these stipulations. Authorized users of the planning area shall provide all employees, contractors, subcontractors, and clients with a briefing regarding stipulations applicable to the lease and/or permit. A copy of applicable stipulations will be posted in a conspicuous place in each work site and campsite.
66. The authorized user shall protect all survey monuments and be responsible for survey costs if remonumentation is required as a result of the user's actions.



67. All activities shall be conducted to avoid or minimize disturbance to vegetation.
68. The BLM, through the AO, reserves the right to impose closure of any area to operators in periods when fire danger or other dangers to natural resources are severe.
69. The authorized user shall be financially responsible for any damage done by a wildfire caused by its operations.
70. Construction camps are prohibited on frozen lakes and river ice. Siting of construction camps on river sand and gravel bars is allowed and, where feasible, encouraged. Where leveling of trailers or modules is required and the surface has a vegetative mat, leveling shall be accomplished through blocking rather than use of a bulldozer.
71. Use of pesticides without the specific authority of the AO is prohibited.
72. The feeding of wildlife by authorized users is prohibited.
73. Hunting and trapping by lessee's employees, agents, and contractors are prohibited when persons are on "work status." Work status is defined as the period during which an individual is under the control and supervision of an employer. Work status is terminated when the individual's shift ends and he/she returns to a public airport (e.g., Fairbanks, Barrow, Nuiqsut, or Deadhorse). Use of lessee facilities, equipment, or transport for personnel access or aid in hunting and trapping is prohibited.
74. Lessees shall conduct a cultural and paleontological resources survey prior to any ground-disturbing activity. Upon finding any potential cultural or paleontological resource, the lessee or their designated representative shall notify the AO and suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the AO.
75. Petroleum exploration and production activities are prohibited within ½ mile of occupied grizzly bear dens, identified by the ADF&G, unless alternative mitigation measures are approved by the AO in consultation with appropriate Federal, State, and NSB regulatory and resource agencies.
76. Oil and gas lessees and their contractors and subcontractors will prepare and implement bear-interaction plans to minimize conflicts between bears and humans. These plans shall include measures to: (a) minimize attraction of bears to the drill sites; (b) organize layout of buildings and work areas to minimize human/bear interactions; (c) warn personnel of bears near or on drill sites and identify proper procedures to be followed; (d) if authorized, deter bears from the drill site; (e) provide contingencies in the event bears do not leave the site or cannot be deterred by authorized personnel; (f) discuss proper storage and disposal of materials that may be toxic to bears; and (g) provide a systematic record of bears on the site and in the immediate area. The lessee's shall develop educational programs and camp layout and management plans as they prepare their lease operations plans. These plans shall be developed in consultation with appropriate Federal, State, and NSB regulatory and resource agencies and submitted to the AO.
77. Operators are encouraged to apply for a letter of authorization from the FWS to conduct activities in polar bear denning areas.



78. Permanent structures, other than oil and gas facilities, are prohibited within 100 feet of the highest high water mark of the nearest body of water.
79. Lessees shall use smokeless flares for handling routine conditions and use auxiliary smokeless flares for planned events that exceed the capacity of routine flares. Lessees shall use flares that meet the Federal New Source Performance design standards listed in 40 CFR 60.18.



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# Glossary







# GLOSSARY

## A

**Acidophilus:** Acid-loving (as in bacteria or plants); growing well in an acid medium.

**Active floodplain:** The flat area along a waterbody where sediments are deposited by seasonal or annual flooding; generally demarcated by a visible high water mark.

**Aerial:** Consisting of, moving through, found in, or suspended in the air.

**Alluvial:** Sedimentary material consisting mainly of coarse sand and gravel.

**Alternatives:** The different means by which objectives or goals can be attained. One of several policies, plans, or projects proposed for decision making.

**Ambient:** A term used to describe the environment as it exists at the point of measurement and against which changes (impacts) are measured.

**Ambient air quality standard:** Air pollutant concentrations of the surrounding outside environment that cannot legally be exceeded during fixed time intervals within a specific geographic area.

**Amphidromous:** A term used to describe fish that spawn and overwinter in rivers and streams, but migrate during the ice-free summer from these freshwater environments into coastal waters months to feed.

**Anadromous:** A term used to describe fish that mature in the sea and swim up freshwater rivers and streams to spawn. Salmon, steelhead, and sea-run cutthroat trout are examples.

**Anticline:** An inverted bowl-shaped structure formed when sedimentary rock layers are folded to produce an arch or elongated dome.

**Anoxic:** The condition of an environment in which free oxygen is lacking or absent.

**Anthropogenic:** Of, relating to, or resulting from the influence of human beings on nature.

**Aquatic:** Growing, living in, frequenting, or taking place in water; in this Amended IAP/EIS, used to indicate habitat, vegetation, and wildlife in freshwater.

**Aromatic hydrocarbon:** A hydrocarbon with a molecular structure involving one or more benzene unsaturated resonant rings of six carbon atoms, and having properties similar to benzene, which is the simplest of the aromatic hydrocarbons.

**Archaeological resource:** Place(s) where the remnants (e.g., artifacts) of a past culture survive in a physical context that allows for the interpretation of these remains. Archaeological resources can be districts, sites, buildings, structures, or objects and can be prehistoric or historic in nature.



**Aufeis:** Thick ice that builds up as a result of repeated overflow.

**Authorized Officer (AO):** Designated agency personnel responsible for a certain area of a project; for the Northeast National Petroleum Reserve – Alaska, generally the BLM State Director.

## B

**Barrel:** Unit of measurement consisting of 42 gallons of oil or other fluid.

**Baseline data:** Data gathered prior to the proposed action to characterize pre-development site conditions.

**Biodegradable:** Capable of being broken down by the action of living organisms such as micro-organisms.

**Biological Assessment (BA):** A document prepared by or under the direction of a federal agency; addresses listed and proposed species and designated and proposed critical habitat that may be present in the action area, and evaluates the potential effects of the action on such species and habitat.

**Black water:** Discharge that includes wastewater from any or all of the following: toilets, urinals, sewage treatment systems.

**Bonding capacity:** An amount, determined by market analysts, based on a government entity's prior bonding experience, actual repayment performance, and its ability to service future, periodic debt. It affects the ability of municipalities to issue and sell bonds to generate funds for capital improvements.

**Bore-hole:** The opening in the ground that is created when drilling a well; may refer to the inside diameter of the bore-hole wall, the rock face that bounds the drilled hole.

**Bottomfast ice:** Ice that is firmly attached or grounded to the bottom of a water body, which is often frozen from top to bottom.

**Brackish:** Water that is intermediate between salt and fresh water; often occurs at the mouths of rivers, where fresh water mixes with salt water.

**Brine:** General description of water that is produced with oil. The water is associated with the oil-producing formation and can have varying amounts of dissolved salts.

**Brood:** A group of young birds being cared for by an adult bird; generally the surviving hatchlings from one or more clutches of eggs.

**Bureau of Land Management (BLM):** An agency of the United States government, under the Department of the Interior, responsible for administering certain public lands of the United States.

**Burin:** A tool flaked into a chisel point for inscribing or grooving bone, wood, leather, stone, or antler.



## C

**Calving area:** A large area where large mammals, particularly ungulates such as caribou, congregate to give birth to their young.

**Capital expenses:** The money spent to purchase or upgrade physical assets, such as buildings or machinery.

**Carrion:** Dead or dying flesh of animals.

**Council on Environmental Quality (CEQ):** An advisory council to the President of the United States; established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

**Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA):** An act that provided the authority for money administered by the Environmental Protection Agency to identify and clean up hazardous waste sites; also known as Superfund.

**Code of Federal Regulations (CFR):** A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.

**cfs:** Cubic feet per second; 1 cfs equals 448.33 gallons per minute.

**Commercial field:** Oil or natural gas fields that can be produced such that they provide a suitable return on investment.

**Commercial oil (or natural gas) reserves:** Oil or natural gas reserves that can be produced such that they provide a suitable return on investment.

**Commercially recoverable:** See commercial oil (or natural gas) reserves.

**Concern:** A point, matter, or question raised by management or the public that must be addressed in the planning process.

**Conglomerate:** Sedimentary rock consisting of gravel and small boulders.

**Consistency determination:** A finding by a state or federal agency that a project or agency action is consistent with a required agency program, guideline, or regulation, such as the Alaska Coastal Zone Management Program.

**Consultation:** Exchange of information and interactive discussion; when the "C" in consultation is capitalized it refers to consultation mandated by statute or regulation that has prescribed parties, procedures, and timelines (e.g. Consultation under NEPA or Section 7 of the Endangered Species Act).



**Criteria:** Data and information that are used to examine or establish the relative degrees of desirability of alternatives or the degree to which a course of action meets an intended objective.

**Cultural resources:** The remains of sites, structures, or objects used by humans in the past, historic or prehistoric. More recently referred to as heritage resources.

**Cumulative effects or impacts:** The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant actions, taken place over a period of time.

## D

**Demersal:** Living near, deposited on, or sinking to the seabed.

**Density:** The number of individuals per a given unit area.

**Deposit:** A natural accumulation, as of precious metals, minerals, coal, gas, and oil that may be pursued for its intrinsic value; gold deposit.

**Development:** The phase of petroleum operations that occurs after exploration has proven successful, and before full-scale production. The newly discovered oil or gas field is assessed during an appraisal phase, a plan to fully and efficiently exploit it is created, and additional wells are usually drilled.

**DEW-Line:** Distant Early Warning Site. A site designed and built during the Cold War as the primary line of air defense warning of "Over the Pole" invasion of the North American Continent.

**Dilution:** The act of mixing or thinning, and therefore decreasing a certain strength or concentration.

**Dispersion:** The act of distributing or separating into lower concentrations or less dense units.

**Dissociable:** Able to break up into simpler chemical constituents.

**Diversity:** An expression of community structure; high if there are many equally abundant species; low if there are only a few equally abundant species. The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

**Draft Environmental Impact Statement (DEIS):** The draft statement of the environmental effects of a major federal action which is required under Section 102 of the National Environmental Policy Act, and released to the public and other agencies for comment and review.

**Drilling fluid (mud):** A preparation of water, clay, and chemicals circulated in a well during drilling to lubricate and cool the drill bit, flush rock cuttings to the surface, prevent



sloughing of the sides of the hole, and prevent the flow of formation fluids into the bore-hole or to the surface.

**Drilling pad:** A temporary drilling site, usually constructed of local materials such as gravel.

**Duck pond:** A small, flat-bottomed plastic receptacle placed under a vehicle to catch and contain any contaminated fluids that may melt or drip from the underside of the vehicle.

## E

**Economically recoverable:** See commercially recoverable.

**Effect:** Environmental change resulting from a proposed action. Direct effects are caused by the action and occur at the same time and place, while indirect effects are caused by the action but are later in time or further removed in distance, although still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effect and impact are synonymous as used in this document.

**Employment:** Labor input into a production process, measured in the number of person-years or jobs; the number of jobs required to produce the output of each sector. A person-year is approximately 2,000 working hours by one person working the whole year or by several persons working seasonally. A job may be 1 week, 1 month, or 1 year.

**Endangered species:** Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range; plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act.

**Energy budget:** The flow of energy through an organism or ecosystem. For an organism, it is the amount of energy being absorbed (e.g., food) in relation to the amount of energy expended and lost as heat.

**Environment:** The physical conditions that exist within an area (e.g., the area that will be affected by a proposed project), including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The sum of all external conditions that affect an organism or community to influence its development or existence.

**Environmental Assessment (EA):** A concise public document, for which a federal agency is responsible, that serves to: 1) briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact; 2) aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary; and, 3) facilitate preparation of an environmental impact statement when one is necessary.

**Environmental Justice:** The fair treatment and meaningful involvement of all people, regardless of natural origin or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic groups, should bear a disproportionate share of the negative environmental consequences resulting from



industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Executive Order 12898 directs federal agencies to achieve environmental justice as part of their missions by identifying and addressing disproportionately high adverse effects of agency programs, policies, and activities, on minority and low-income populations.

**Environmental Impact Statement (EIS):** An analytical document prepared under the National Environmental Policy Act (NEPA) that portrays the potential impacts to the environment of a Preferred Action and its possible alternatives. An EIS is developed for use by decision-makers to weigh the environmental consequences of a potential decision.

**Erosion:** The wearing away of the land surface by running water, wind, ice, or other geologic agents, including gravitation creep.

**Eskimo:** An ethnonym (name given to a group by another group) referring to speakers of the Inuit language family who live in the Arctic and Subarctic regions of North America (e.g., Canada, Greenland and Alaska) and eastern Siberia.

**Essential Fish Habitat (EFH):** As defined by Congress in the interim final rule (62FR 66551): “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” For the purpose of interpreting the definition of EFH habitat, “waters” include aquatic areas and their associated physical, chemical, and biological properties; “substrate” includes sediment underlying the waters; “necessary” refers to the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers all habitat types utilized by a species throughout its life cycle.

**Estuary:** An estuary is a partially enclosed body of water formed where freshwater from rivers and streams flows into the ocean, mixing with the salty seawater. Estuaries and the lands surrounding them are places of transition from land to sea, and from fresh to salt water.

**Ethnographic:** Of or pertaining to the descriptive and analytical study of the culture of particular self-defined groups or communities.

**Exploration:** The search for economic deposits of minerals, gas, oil or coal through the practices of geology, geochemistry, geophysics, drilling, shaft sinking, and/or mapping.

## F

**°F:** Degrees Fahrenheit.

**Fast-ice zone:** Area along the coast covered by sea ice that is continuous with and attached to the shoreline.

**Feasible:** Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

**Final Environmental Impact Statement (Final EIS):** A revision of the Draft Environmental Impact Statement that includes public and agency comments on the draft.



**Fisheries habitat:** Streams, lakes, and reservoirs that support fish populations.

**Fishery:** The act, process, occupation, or season of taking an aquatic species.

**Floodplain:** The lowland and relatively flat area adjoining inland waters, including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year.

**Fluvial:** Of or relating to a stream or river.

**Fossil:** Evidence or remnant of a plant or animal preserved in the earth's crust (e.g., skeleton, footprint, or leaf print).

**Fossil fuel:** Petroleum, natural gas, and coal; fuel derived from biologic material that was deposited into sedimentary rocks.

**Frequency:** The number of samples in which a plant or animal species occurs divided by the total number of samples.

**Fugitive dust:** Dust particles suspended randomly in the air, usually from road travel, excavation, and/or rock loading operations.

## G

**Game Management Unit (GMU):** A geographic division made by the Alaska Department of Fish and Game for the management of fish and wildlife in the State. Different GMUs have different hunting and fishing seasons, bag limits, and other harvest rules.

**Geology:** The scientific study of the origin, history, and structure of the earth; the structure of a specific region of the earth's surface.

**Geomorphic:** Pertaining to the structure, origin, and development of the topographical features of the earth's crust.

**Gill net:** Nets made of one or more layers of mesh, used to catch fish by entanglement as they attempt to swim through the net.

**Glacial drift:** Unsorted sediments deposited by glaciers and not subsequently reworked by water; coarse-grained materials (e.g., rock and sand) suspended in a fine-grained (e.g., silt) matrix. The term applies to all mineral material transported by a glacier and deposited directly by or from the ice, or by running water emanating from a glacier.

**Global warming:** An increase over time of the average temperature of the earth's atmosphere and oceans. It is generally used to describe the temperature rise over the past century or so, and the effects of humans on the temperature.

**Gray water:** Discharge that includes wastewater from any or all of the following: kitchen sink, shower, drinking water, and laundry.

**Greenhouse gas:** A gas, such as carbon dioxide or methane, that is relatively transparent to the higher-energy sunlight, but traps lower-energy infrared radiation. Greenhouse gases



have the ability to allow sunlight to warm the earth but trap the heat in, thereby potentially raising the earth's temperature. Greenhouse gases associated with the "greenhouse effect" and global warming.

**Groundwater:** Water found beneath the land surface in the zone of saturation below the water table.

## H

**Habitat:** The natural environment of a plant or animal, including all biotic, climatic, and soil conditions, or other environmental influences affecting living conditions. The place where an organism lives.

**Hazardous waste:** As defined by the Environmental Protection Agency, a waste that exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, and/or toxicity. Hazardous wastes are listed in 40 CFR § 261.3 and 40 CFR § 171.8.

**Headwaters:** The upper reaches of a stream where the stream forms.

**Hydrocarbon:** A naturally occurring organic compound comprised of hydrogen and carbon. Hydrocarbons can occur in molecules as simple as methane (one carbon atom with four hydrogen atoms), but also as highly complex molecules, and can occur as gases, liquids, or solids. The molecules can have the shape of chains, branching chains, rings, or other structures. Petroleum is a complex mixture of hydrocarbons. The most common hydrocarbons are natural gas, oil, and coal.

**Hydrologic system:** The combination of all physical factors, such as precipitation, stream flow, snowmelt, and groundwater that affect the hydrology of a specific area.

## I

**Impermeable:** Not permitting passage of fluids through its mass.

**Impoundment:** The collection and confinement, usually of water (in the case of mining, tailings materials), in a reservoir or other storage area.

**Increment:** An amount of change from an existing concentration or amount, such as air pollutant concentrations.

**Indigenous:** Having originated in and being produced, growing, living, or occurring naturally in a particular region or environment.

**Indirect impacts:** Impacts that are caused by an action, but are later in time or farther removed in distance, although still reasonably foreseeable.

**Infrastructure:** The underlying foundation or basic framework; substructure of a community (i.e., schools, police, fire services, hospitals, water, and sewer systems).

**Insect-relief area:** An area of the North Slope with relatively low numbers of insects that is used by caribou for relief from insects.



**Interstitial ice:** Ice found in cavities or lodged between soil grains or rock crevices.

**Irretrievable:** A term that applies to losses of production, harvest, or commitment of renewable natural resources. For example, some or all of the wildlife forage production from an area is irretrievably lost during the time an area is used as an oil or gas development site. If the use changes, forage production can be resumed. The production lost is irretrievable, but the act is not irreversible.

**Irreversible:** A term that applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

**Isobath:** Depth interval contour, as commonly mapped for lake or ocean bottoms.

## J

**Jurisdictional wetland:** A wetland area delineated and identified by specific technical criteria, field indicators, and other information, for the purposes of public agency jurisdiction. The U.S. Army Corps of Engineers regulates “dredging and filling” activities associated with jurisdictional wetlands. Other federal agencies that can become involved with matters that concern jurisdictional wetlands include the U.S. Department of Interior’s Fish and Wildlife Service, the Environmental Protection Agency, and the Natural Resource Conservation Service.

## K

## L

**Landfast ice:** Stationary ice that is continuous with, and attached to, the shoreline and extends out into the waterbody.

**Landform:** Any physical, recognizable form or feature on the earth’s surface having a characteristic shape, that is produced by natural causes. Landforms provide an empirical description of similar portions of the earth’s surface.

**Land management:** The intentional process of planning, organizing, programming, coordinating, directing, and controlling land use actions.

**Landscape:** The sum total of the characteristics that distinguish a certain area on the earth’s surface from other areas; these characteristics are a result not only of natural forces but also of human occupancy and use of the land. An area composed of interacting and interconnected patterns of habitats (ecosystems), which are repeated because of geology, landforms, soils, climate, biota, and human influences throughout the area.

**Land status:** The ownership status of lands.



**Land use allocation:** The assignment of a management emphasis to particular land areas with the purpose of achieving the goals and objectives of some specified use(s) (e.g., campgrounds, wilderness, logging, and mining).

**Laterally discontinuous:** Not continuous in the horizontal plane. For example, in an area with laterally discontinuous permafrost, the permafrost is not uniformly found across the entire area without interruption.

**Lead:** Long cracks in the ice, used by both whales and boats to travel through the water.

**Liquid natural gas:** Natural gas which has been liquefied by reducing its temperature to -260 °F at atmospheric pressure. It will remain as a liquid at -116 °F and 673 pounds per square inch above atmospheric pressure.

**Listed species:** Species that are listed as threatened or endangered under the Endangered Species Act of 1973 (as amended).

**Long-term impacts:** Impacts that normally result in permanent changes to the environment. An example is the loss of habitat due to development of a gravel pit. For each resource, the definition of long-term may vary.

## M

**Maktak:** Eskimo delicacy consisting of the skin and the thin layer of subcutaneous fat of whales.

**Management activity:** A human activity imposed on a landscape for the purpose of harvesting, traversing, transporting, or replenishing natural resources.

**Management area:** An area delineated on the basis of management objective prescriptions.

**Management concern:** An issue, problem, or condition that influences the range of management practices identified in a planning process.

**Management direction:** A statement of multiple use and other goals and objectives, and the associated management prescriptions, standards, and guidelines for attaining them (36 CFR § 219.3).

**Masu:** A starchy tuber found in Arctic and Subarctic regions (vernacular is "Eskimo potato").

**Mean:** A statistical value calculated by dividing the sum of a set of sample values by the number of samples. Also referred to as the arithmetic mean or average.

**Migratory:** Moving from place to place, daily or seasonally.

**Mitigation:** Steps taken to: 1) avoid an impact altogether by not taking a certain action or parts of an action; 2) minimize an impact by limiting the degree or magnitude of the action and its implementation; 3) rectify an impact by repairing, rehabilitating, or restoring the affected environment; 4) reduce or eliminate an impact over time by preserving and



maintaining operations during the life of the action; and, 5) compensate for an impact by replacing or providing substitute resources or environments (40 CFR Part 1508.20).

**Memorandum of Understanding (MOU):** Usually documents an agreement reached amongst federal agencies.

## N

**National Environmental Policy Act (NEPA):** An act declaring a national policy to encourage productive and enjoyable harmony between humankind and the environment; promote efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity; enrich the understanding of the ecological systems and natural resources important to the nation; and establish a Council on Environmental Quality.

**Net present value (NPV):** The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area.

**National Pollutant Discharge Elimination System (NPDES):** A program authorized by Sections 318, 402, and 405 of the Clean Water Act, and implemented by regulations 40 CFR § 122. The NPDES program requires permits for the discharge of pollutants from any point source into waters of the United States.

**No-Surface-Occupancy:** An area that is open for mineral leasing but analysis has found that in order to protect other resource values, no surface occupancy is permitted for oil and gas facilities or infrastructure.

## O

**Objective:** A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used to achieve identified goals.

**Oiled:** Having oil on skin, fur, or feathers after coming into contact with an oil spill.

**Ozone:** Form of oxygen found largely in the stratosphere; a product of the reaction between ultraviolet light and oxygen.

## P

**Particulates:** Small particles suspended in the air, generally considered pollutants.

**Pelagic:** Pertaining to the ocean and especially to animals (typically marine mammals, birds, or fish) that live at the surface of the ocean away from the coast.

**Per capita income:** Total income divided by the total population.



**Performance-based stipulation:** A stipulation applied to leases that provides a stated objective that must be met, along with requirements and guidelines, but provides some leeway as to how that objective can be met and maintained by the lessee; compare to prescriptive-based stipulation.

**Permafrost:** Permanently frozen ground.

**Permanent oil and gas facilities:** Production facilities, pipelines, roads, airstrips, production pads, docks, seawater treatment plants, and other structures associated with oil and gas production that occupy land for more than 1 winter season. Material sites and seasonal facilities, such as ice roads, are excluded, even when the pads are designed for use in successive winters.

**Permeability:** The property or capacity of a porous rock, sediment, or soil for transmitting a fluid; a measure of the relative ease of fluid flow under unequal pressure.

**Photoperiod:** In reference to cycles of light and darkness, the length of time that uninterrupted light is present, generally the length of daylight in a given 24 hour period.

**Physiographic province:** A region having a particular pattern of relief features or land forms that differs significantly from that of adjacent regions (e.g., Arctic Coastal Plain).

**Pingo:** A low conical hill or mound forced up by hydrostatic pressure in an area underlain by permafrost and consisting of an outer layer of soil covering a core of solid ice. Pingos range from 6 to 160 meters in height.

**Planning Area:** An administrative unit determined by the Bureau of Land Management based on resources and management issues. Large properties (such as the National Petroleum Reserve – Alaska) are divided into smaller planning areas so that studies and management decisions can be made on a more local level.

**Plant community:** A vegetation complex, unique in its combination of plants, which occurs in particular locations under particular influences. A plant community is a reflection of integrated environmental influences on the site, such as soils, temperature, elevation, solar radiation, slope aspect, and precipitation.

**Pollution:** Human-caused or natural alteration of the physical, biological, and radiological integrity of water, air, or other aspects of the environment that produces undesired effects.

**Polygon:** A surface landform resulting from repeated freeze-thaw cycles common in permafrost areas. Polygons are bounded by troughs of ice or water and generally occur in networks that form regular geometric designs with multiple square sides of nearly equal lengths.

**Polynyas:** Non-linear openings in the sea ice.

**Porosity:** The ratio of the volume of void space in a material (e.g., sedimentary rock or sediments) to the volume of its mass.

**Potable:** Suitable, safe, or prepared for drinking, as in potable water.



**Pot hunting:** The removal or theft of artifacts from cultural resource sites by untrained individuals for profit and recreation.

**Prescriptive-based stipulation:** A stipulation applied to leases with exacting requirements applying to lessee activities; compare to performance-based stipulation.

**Prevention of significant deterioration (PSD):** A special permit procedure established in the Clean Air Act, as amended, used to ensure that economic growth occurs in a manner consistent with the protection of public health and preservation of air quality related values in national special interest areas.

**Pristine:** Pure, original, and uncontaminated.

**Prospect:** An area of exploration in which hydrocarbons have been predicted to exist in commercially recoverable quantities.

**Public scoping:** A process whereby the public is given the opportunity to provide oral or written comments about the influence of a project on an individual, the community, and/or the environment.

**Pulse:** A group of whales; the term is applied to whales migrating across the Chukchi and Beaufort seas, when there are more individuals in each pod of whales and more pods than usual.

**Pyrogenic:** producing or produced by heat.

## Q

## R

**Raptor:** Bird of prey; includes eagles, hawks, falcons, and owls.

**Recharge:** Absorption and addition of water into the zone of saturation.

**Record of Decision (ROD):** A document separate from, but associated with, an Environmental Impact Statement, which states the decision, identifies alternatives (specifying which were environmentally preferable), and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and, if not, why not (40 CFR § 1505.2).

**Recoverable reserves:** Oil and gas reserves that may be recoverable by the application of technology, but not necessarily commercially recoverable.

**Reservoir (oil or gas):** A subsurface body of rock having sufficient porosity and permeability to store and transmit fluids. Sedimentary rocks are the most common reservoir rocks because they have more porosity than most igneous and metamorphic rocks and form under temperature conditions at which hydrocarbons can be preserved. A reservoir is a critical component of a complete petroleum system.



**Resident:** A species that is found in a particular habitat for a particular time period (e.g., winter resident or summer resident) as opposed to a species found only when passing through during migration.

**Resource Management Plan (RMP):** Comprehensive land management planning document prepared by and for the Bureau of Land Management's administered properties under requirements of the Federal Land Policy and Management Act. Bureau of Land Management lands in Alaska were exempted from this requirement.

**Rideup:** A raised-relief ice formation that is formed when a moving ice sheet is forced up and over other structures such as land or ice.

**Riffles:** Stream segments where the water is relatively shallow, current velocity is relatively high, and sediments are coarse; riffles are located in between areas of deeper, slower water (pools).

**Rift zone:** Zone of faulting where rocks are pulled apart.

**Riparian:** Occurring adjacent to streams and rivers and directly influenced by water. A riparian community is characterized by certain types of vegetation, soils, hydrology, and fauna and requires free or unbound water or conditions more moist than that normally found in the area.

**Risked mean:** The arithmetic average of all possible resource outcomes weighted by their probabilities. Risked (unconditional) estimates of resources such as oil or natural gas consider the possibility that the area may be devoid of those resources. Statistically, the risked mean may be determined through multiplication of the mean of a conditional distribution by the related probability of occurrence.

**Rolligon:** A brand name or make of wheeled vehicle that exerts low pressure on the ground, and is designed to travel across sensitive areas such as tundra with minimal disturbance.

## S

**Satellite field:** An oil reserve located near an existing oil development, allowing shared use of the infrastructure.

**Scenic River:** River designation, under the Federal Wild and Scenic Rivers Program, on the basis of undisturbed and scenic character. Scenic rivers are given special management criteria by federal agencies.

**Scoping process:** A part of the National Environmental Policy Act process; early and open activities used to determine the scope and significance of the issues, and the range of actions, alternatives, and impacts to be considered in an Environmental Impact Statement (40 CFR § 1501.7).

**Sediments:** Unweathered geologic materials generally laid down by or within waterbodies; the rocks, sand, mud, silt, and clay at the bottom and along the edge of lakes, streams, and oceans.



**Sensitive species:** Plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations. Species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species.

**Short-term impacts:** Impacts occurring during project construction and operation, and normally ceasing upon project closure and reclamation. For each resource the definition of short-term may vary.

**Sidetrack well:** A secondary well-bore drilled away from an original well-bore. A sidetracking operation may be done intentionally or may occur accidentally.

**Significant:** The description of an impact that exceeds a certain threshold level. Requires consideration of both context and intensity. The significance of an action must be analyzed in several contexts, such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts, which should be weighted along with the likelihood of its occurrence.

**SO<sub>x</sub>:** Sulfur oxides, including sulfur dioxide (SO<sub>2</sub>). A product of vehicle tailpipe emissions.

**Sociocultural:** Of, relating to, or involving a combination of social and cultural factors.

**Socioeconomic:** Pertaining to, or signifying the combination or interaction of social and economic factors.

**Soil horizon:** A layer of soil material approximately parallel to the land surface that differs from adjacent genetically related layers in physical, chemical, and biological properties.

**Solid waste:** Garbage, refuse, and/or sludge produced during oil and gas exploration and development activities.

**Spawning:** Production, deposition, and fertilization of eggs by fish.

**Special Use Permit:** A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of federal or state lands for some special purpose.

**Spill Prevention Control and Countermeasure Plan (SPCC):** A plan that the Environmental Protection Agency requires to be on file within six months of project inception. It is a contingency plan for avoidance of, containment of, and response to spills or leaks of hazardous materials.

**Spine road:** The existing all-season gravel road connecting the oil and gas facilities at Kuparuk (Kuparuk Base Camp) with those at Prudhoe Bay (Prudhoe Bay Operations Center).

**Standard:** A model, example, or goal established by authority, custom, or general consent as a rule for the measurement of quantity, weight, extent, value, or quality.

**Stipulation:** A requirement or condition placed by the Bureau of Land Management on the leaseholder for operations the leaseholder might carry out within that lease. The Bureau of



Land Management develops standard stipulations that apply to all future leases within the Northeast National Petroleum Reserve – Alaska.

**Stratigraphic trap:** An oil or gas reservoir in which the hydrocarbons are trapped because of a lateral change in the physical characteristics of the reservoir or a change in the lateral continuity of the rocks.

**Strike:** The act of throwing a darting gun harpoon with a black powder or penthrite bomb into a whale. A strike may or may not result in a dead whale, which may or may not result in a landed whale. The International Whaling Commission considers and counts the number of strikes and landed whales in their quota allocation to the U.S. government (and hence to the Alaska Eskimos). Unused strikes can be transferred to other individuals or groups harvesting whales.

**Subsistence:** Harvesting of plants and wildlife for food, clothing, and shelter. The attainment of most of one's material needs (e.g., food and clothing materials) from wild animals and plants.

## T

**Talik:** An unfrozen section of ground found above, below, or within a layer of discontinuous permafrost. These layers can also be found beneath water bodies in a layer of continuous permafrost.

**Tectonic plate:** A large, thin, relatively rigid plate that moves relative to other plates on the outer surface of the earth.

**Terrestrial:** Of or relating to the earth, soil, or land; inhabiting the earth or land.

**Thermokarst:** Land-surface configuration that results from the melting of ground ice in a region underlain by permafrost. In areas that have appreciable amounts of ice, small pits, valleys, and hummocks form when the ice melts and the ground settles unevenly.

**Threatened species:** A plant or animal species likely to become an endangered species throughout all or a significant portion of its range within the foreseeable future.

**Total petroleum system:** The combination of geologic components and processes necessary to generate and store hydrocarbons, including a mature source rock, migration pathway, reservoir rock, trap, and seal. Includes all the petroleum generated by related source rocks and resides in a volume of mappable rocks. Geologic processes act upon the petroleum system and control the generation, expulsion, migration, entrapment, and preservation of petroleum.

**Traditional knowledge:** An intimate understanding by indigenous peoples of their environment, which is grounded in a long-term relationship with the surrounding land, ocean, rivers, ice, and resources. This understanding includes knowledge of the anatomy, biology, and distribution of resources; animal behavior; seasons, weather, and climate; hydrology, sea ice, and currents; how ecosystems function; and the relationship between the environment and the local culture.



**Transfer payment:** Money given by the government to citizens, such as Social Security, welfare, and unemployment compensation.

**Trophic system:** The process and organisms that move food energy through the ecosystem, often termed a food chain.

**Tundra:** Level or undulating treeless plain characteristic of northern Arctic regions, consisting of black mucky soil with a permanently frozen subsoil and a dense growth of mosses, lichens, dwarf herbs, and shrubs.

**Turbidity:** A measure of the amount of suspended sediment in water.

**U**

**V**

**W**

**Waterflooding:** The injection of water into geological reservoirs to maintain or increase pressure in the reservoir and thereby assist in the extraction of oil.

**Water quality:** The interaction between various parameters that determines the usability or non-usability of water for on-site and downstream uses. Major parameters that affect water quality include: temperature, turbidity, suspended sediment, conductivity, dissolved oxygen, pH, specific ions, discharge, and fecal coliform.

**Wetlands (biological wetlands):** Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include habitats such as swamps, marshes, and bogs (see jurisdictional wetlands).

**Wildcat play:** An unproven and prospective area of oil and gas potential that is outside of existing oil and gas producing areas or zones.

**Wilderness:** Land designated by Congress as a component of the National Wilderness Preservation System. For an area to be considered for Wilderness designation it must be roadless and possess the characteristics required by Section 2(c) of the Wilderness Act of 1964. These characteristics are: 1) naturalness - lands that are natural and primarily affected by the forces of nature; 2) roadless and having at least 5,000 acres of contiguous public lands; and 3) outstanding opportunities for solitude or a primitive and unconfined types of recreation. In addition, areas may contain "supplemental values," consisting of ecological, geological or other features of scientific, educational, scenic or historical importance.



U  
V  
W



# Acroynms







## Acronyms, Abbreviations, and Symbols

<b>AAAQS</b>	Alaska Ambient Air Quality Standards
<b>AAC</b>	Alaska Administrative Code
<b>AADT</b>	Annual Average Daily Traffic (count)
<b>ac</b>	acre
<b>ACI</b>	Alaska Consultants, Inc.
<b>ACIA</b>	Arctic Climate Impact Assessment
<b>ACMA</b>	Alaska Coastal Management Act
<b>ACMP</b>	Alaska Coastal Management Program
<b>ACP</b>	Arctic Coastal Plain
<b>AC&amp;W</b>	Aircraft Control and Warning
<b>ADCED</b>	Alaska Department of Community and Economic Development
<b>ADEC</b>	Alaska Department of Environmental Conservation
<b>ADFG</b>	Alaska Department of Fish and Game
<b>ADGC</b>	Alaska Division of Governmental Coordination
<b>ADNR</b>	Alaska Department of Natural Resources
<b>ADOL</b>	Alaska Department of Labor
<b>ADOLWD</b>	Alaska Department of Labor and Workforce Development
<b>ADOTPF</b>	Alaska Department of Transportation and Public Facilities
<b>ADR</b>	Alaska Department of Revenue
<b>AGL</b>	Above Ground Level
<b>AHRS</b>	Alaska Heritage Resources Survey
<b>ANCSA</b>	Alaska Native Claims Settlement Act
<b>ANGTS</b>	Alaska Natural Gas Transportation System
<b>ANILCA</b>	Alaska National Interest Lands Conservation Act
<b>ANS</b>	Alaska North Slope; Arctic North Slope
<b>ANWR</b>	Arctic National Wildlife Refuge
<b>AO</b>	Authorized Officer
<b>AOGCC</b>	Alaska Oil and Gas Conservation Commission
<b>AQRV</b>	Air Quality Related Values
<b>ARCO</b>	Atlantic Richfield Company
<b>ARL</b>	Arctic Research Laboratory
<b>AS</b>	Alaska Statutes
<b>ASDP</b>	Alpine Satellite Development Project
<b>ASRC</b>	Arctic Slope Regional Corporation
<b>ASTt</b>	Arctic Small Tool tradition
<b>BA</b>	Biological Assessment
<b>bbl</b>	barrel
<b>Bbbl</b>	Billion barrels



<b>BCBS</b>	Bering-Chukchi-Beaufort Seas
<b>BD/DR</b>	Building Demolition and Debris Removal
<b>BEA</b>	Bureau of Economic Analysis
<b>BIA</b>	Bureau of Indian Affairs
<b>BLM</b>	Bureau of Land Management
<b>BP</b>	British Petroleum
<b>BPXA</b>	British Petroleum Exploration – Alaska
<b>CAA</b>	Clean Air Act
<b>CAFF</b>	Conservation of Arctic Flora and Fauna
<b>CAH</b>	Central Arctic Herd (of caribou)
<b>CCP</b>	Central Compressor Plant
<b>CD</b>	Colville Delta
<b>CEQ</b>	Council on Environmental Quality
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation and Liability Act
<b>CFR</b>	Code of Federal Regulations
<b>CIAP</b>	Coastal Impact Assistance Program
<b>CIP</b>	Capital Improvement Project
<b>CIRI</b>	Cook Inlet Region Incorporated
<b>cm</b>	centimeter
<b>CM</b>	Cost of Mitigation
<b>CMP</b>	Coastal Management Program
<b>CO</b>	Carbon Monoxide
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CPF</b>	Central Production Facility
<b>CRA</b>	Circumpolar Research Associates
<b>CRSA</b>	Colville River Special Area
<b>CWA</b>	Clean Water Act
<b>CZMA</b>	Coastal Zone Management Act
<b>DDT</b>	Dichlorodiphenyltrichloroethane
<b>DEW-Line</b>	Distant Early Warning Line (System)
<b>EA</b>	Environmental Assessment
<b>EEZ</b>	Exclusive Economic Zone
<b>EFH</b>	Essential Fish Habitat
<b>EIS</b>	Environmental Impact Statement
<b>EO</b>	Executive Order
<b>EPCA</b>	Energy Policy and Conservation Act
<b>ESA</b>	Endangered Species Act
<b>FEP</b>	Full Economic Potential
<b>FFD</b>	Full Field Development
<b>FLIR</b>	Forward Looking Infrared Radar
<b>FR</b>	Federal Register
<b>FLPMA</b>	Federal Land Policy and Management Act
<b>ft</b>	foot/feet
<b>FY</b>	Fiscal Year



<b>gal</b>	gallon(s)
<b>gal/day</b>	gallons per day
<b>GAO</b>	U.S. General Accounting Office
<b>GMU</b>	Game Management Unit
<b>GOR</b>	Gas-to-Oil Ratio
<b>GTL</b>	Gas-to-Liquid Ratio
<b>HRAF</b>	Human Relations Area Files, Inc.
<b>H<sub>2</sub>S</b>	Hydrogen Sulfide
<b>IAI</b>	Impact Assessment, Inc.
<b>IAP</b>	Integrated Activity Plan
<b>ICAS</b>	Iñupiat Community of the Arctic Slope
<b>in</b>	inch
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRA</b>	Indian Reorganization Act
<b>IRP</b>	Industrial Roads Program
<b>ISER</b>	Institute of Social and Economic Research
<b>km</b>	kilometer(s)
<b>km<sup>2</sup></b>	square kilometer(s)
<b>KOP</b>	Key Observation Point
<b>KRU</b>	Kuparuk River Unit
<b>LADS</b>	Light Automated Drilling System
<b>lb</b>	pound(s)
<b>LC<sub>50</sub></b>	lethal dose at which half of the organisms die
<b>LMR</b>	Land Management Regulation
<b>LNG</b>	Liquid Natural Gas
<b>LPG</b>	Liquefied Petroleum Gas
<b>LRR</b>	Long Range Radar
<b>LRRS</b>	Long Range Radar Site
<b>LUEA</b>	Land Use Emphasis Area
<b>m</b>	meter(s)
<b>m<sup>2</sup></b>	square meter(s)
<b>m<sup>3</sup></b>	cubic meter(s)
<b>Mcf</b>	Thousand cubic feet (of gas)
<b>Meq/l</b>	Milliequivalents per liter
<b>mg</b>	milligram(s)
<b>mg/l</b>	milligrams per liter
<b>mi</b>	mile(s)
<b>mi<sup>2</sup></b>	square mile(s)
<b>MMbbl</b>	Million barrels (of oil)
<b>MMbpd</b>	Million barrels per day (of oil)
<b>MMcfd</b>	Million cubic feet per day (of gas)
<b>MMPA</b>	Marine Mammal Protection Act
<b>MMS</b>	Minerals Management Service
<b>Mpa</b>	megapaseals



<b>M-SFMCA</b>	Magnuson-Stevens Fishery Management and Conservation Act
<b>MOU</b>	Memorandum of Understanding
<b>MWD</b>	Measurement while Drilling
<b>NA</b>	Not Applicable
<b>NAAQS</b>	National Ambient Air Quality Standard
<b>NARL</b>	Naval Arctic Research Laboratory
<b>NEPA</b>	National Environmental Policy Act
<b>NHPA</b>	National Historic Preservation Act
<b>NMFS</b>	National Marine Fisheries Service
<b>NO</b>	Nitric Oxide
<b>NO<sub>x</sub></b>	Nitrogen Oxides
<b>NO<sub>2</sub></b>	Nitrogen Dioxide
<b>NOA</b>	Notice of Availability
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NPDES</b>	National Pollution Discharge Elimination System
<b>NPR-A</b>	National Petroleum Reserve-Alaska
<b>NPRPA</b>	Naval Petroleum Reserves Production Act
<b>NRC</b>	National Research Council
<b>NRHP</b>	National Register of Historic Places
<b>NSB</b>	North Slope Borough
<b>NSBMC</b>	North Slope Borough Municipal Code
<b>NSMOG</b>	North Slope Management Oversight Group
<b>NSO</b>	No Surface Occupancy
<b>NSSI</b>	North Slope Initiative
<b>NWI</b>	National Wetlands Inventory
<b>NWS</b>	Northern Warning System
<b>O<sub>3</sub></b>	Ozone
<b>OCS</b>	Outer Continental Shelf
<b>OCSEAP</b>	Outer Continental Shelf Environmental Assessment Program
<b>OCSLA</b>	Outer Continental Shelf Lands Act
<b>OHA</b>	Office of History and Archaeology
<b>OHV</b>	Off-highway Vehicle
<b>ONR</b>	Office of Naval Research
<b>OPEC</b>	Organization of the Petroleum Exporting Countries
<b>ORV</b>	Off-road Vehicle
<b>OSC</b>	On-scene Coordinator
<b>OWM</b>	Oil-weathering Model
<b>PAH</b>	Polycyclic Aromatic Hydrocarbons
<b>PAI</b>	Phillips Alaska, Inc.
<b>PET-4</b>	Naval Petroleum Reserve Number 4
<b>pH</b>	Measure of hydrogen ion concentration in the water
<b>PL</b>	Public Law
<b>PM</b>	Particulate Matter
<b>PM<sub>2.5</sub></b>	Particulate matter > 2.5 microns in diameter



<b>PM<sub>10</sub></b>	particulate matter > 10 micron in diameter
<b>POL</b>	Petroleum, Oil, and Lubricants
<b>ppb</b>	parts per billion
<b>ppm</b>	parts per million
<b>ppt</b>	parts per thousand
<b>PSD</b>	Prevention of Significant Deterioration
<b>RCRA</b>	Resource Conservation and Recovery Act of 1976
<b>RFSUNY</b>	Research Foundation of the State University of New York
<b>RI/FS</b>	Remedial Investigation and Feasibility Study
<b>RMP</b>	Resource Management Plan
<b>RMT</b>	Research and Monitoring Team
<b>RN</b>	Roaded Natural
<b>ROD</b>	Record of Decision
<b>ROP</b>	Required Operating Procedure
<b>ROS</b>	Recreation Opportunity Spectrum
<b>ROW</b>	Right-of-Way
<b>SAP</b>	Subsistence Advisory Panel
<b>SHPO</b>	State Historic Preservation Officer
<b>SO<sub>x</sub></b>	Sulfur Oxides
<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>SQRU</b>	Scenic Quality Rating Unit
<b>SPM</b>	Semi Primitive Motorized
<b>SRBA</b>	Stephen R. Braund and Associates
<b>SRP</b>	Special Recreation Permit
<b>SRR</b>	Short Range Radar
<b>SRRS</b>	Short Range Radar Site
<b>TAGS</b>	Trans Alaska Gas System
<b>TAPS</b>	Trans-Alaska Pipeline System
<b>TAPSO</b>	Trans-Alaska Pipeline System Owners
<b>Tcf</b>	Trillion cubic feet (of gas)
<b>TEA</b>	Transportation Enhancement Act
<b>TERA</b>	Troy Ecological Research Associates
<b>TLCH</b>	Teshekpuk Lake Caribou Herd Area
<b>TLH</b>	Teshekpuk Lake Herd (of caribou)
<b>TLSA</b>	Teshekpuk Lake Special Area
<b>TLUI</b>	Traditional Land Use Inventory
<b>TVD</b>	True Vertical Depth
<b>UAA</b>	University of Alaska, Anchorage
<b>UIC</b>	Ukpeagvik Innpiat Corporation
<b>UL</b>	Unavailable for Leasing
<b>USC</b>	United States Code
<b>USACE</b>	U.S. Army Corps of Engineers
<b>USDOC</b>	U.S. Department of Commerce
<b>USDOD</b>	U.S. Department of Defense



<b>USDOE</b>	U.S. Department of Energy
<b>USDOI</b>	U.S. Department of Interior
<b>USDOL</b>	U.S. Department of Labor
<b>USEPA</b>	U.S. Environmental Protection Agency
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>USGCRP</b>	U.S. Global Change Research Program
<b>USGS</b>	U.S. Geological Survey
<b>VOC</b>	Volatile Organic Compounds
<b>VRM</b>	Visual Resource Management
<b>VSM</b>	Vertical Support Member
<b>WAC</b>	White Alice Communications
<b>WACS</b>	White Alice Communication System
<b>WAH</b>	Western Arctic Herd (of caribou)
<b>WSR</b>	Wild and Scenic Rivers
<b>WSRA</b>	Wild and Scenic Rivers Act
<b>yd</b>	yard(s)
<b>yd<sup>3</sup></b>	cubic yard(s)
<b>Y-K Delta</b>	Yukon-Kuskokwim Delta
<b>≥</b>	greater than or equal to
<b>≤</b>	less than or equal to
<b>&gt;</b>	greater than/more than
<b>&lt;</b>	less than
<b>μg/m<sup>3</sup></b>	micrograms per cubic meter
<b>°F</b>	degrees Fahrenheit







